THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—46TH YEAR SYDNEY, SATURDAY, OCTOBER 31, 1959 No. 18

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STAPHYLOCOCCAL PNEUMONIA IN INFANTS.

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ONCE rarely seen, infantile staphylococcal pneumonia is now one of the commonest serious diseases seen in pædiatric practice.

In 1955, Rountree and Freeman pointed out the continent-wide distribution of a new phage type (type 80) *Staphylococcus aureus* causing outbreaks of neonatal infections in Australian hospitals. This strain is one of more than ordinary virulence with a significant occurrence in pyothorax in young infants. Eight cases of this condition were mentioned; all occurred during the last four months of 1954.

Wallman *et alii* (1955) reported 55 cases which occurred in a period of 29 months at the Princess Margaret Hopital for Children, Perth, and Harley (1957) reviewed 32 cases (in infants and children) occurring in a 24-month period at the Royal Alexandra Hospital for Children, Sydney.

Nineteen cases encountered in a children's ward at a country centre over a period of 20 months are reported here, to emphasize further the dangers incumbent upon increasing dissemination of the staphylococcus in the Australian population.

Patient Material.

The 33-bed children's ward at the Mater Hospital, Newcastle, receives all the infants and children admitted to that hospital, whatever the nature of their illness (medical, surgical, ear, nose and throat, etc.). In the period from May, 1957, to December, 1958, there have been present in the ward 19 patients with a serious lower respiratory tract infection, considered to be staphylococcal in ætiology. This diagnosis has been based on clinical, radiological and, when possible, bacteriological findings. One of the patients had coexistent mucoviscidosis. This left 18 patients without any obvious underlying contributory disease.

These 18 patients, born in the various maternity units in the Newcastle district, will be considered further.

Age.

All patients were aged two years or less at the time of admission to hospital, the youngest being 16 days of age; 13 were aged six months or less.

Seasonal Incidence.

It is generally agreed that staphylococcal pneumonia is most prevalent in the winter months, when upper respiratory tract infections are more prone to occur

(Wallman *et alii*, 1955; Harley, 1957; Pryles, 1958). However, this was not evident in this series, there being an even spread of cases in the months under review.

History and Clinical Findings.

The usual history was that of an infant originally diagnosed as suffering from an acute upper respiratory tract infection, becoming progressively more ill and distressed despite antibiotic therapy. At the time of admission to hospital, the patient usually presented a picture of acute distress, being pyrexial and markedly dyspnœic, with grunting respiration, irritating cough, abdominal distension and whimpering restlessness. Auscultation revealed generalized wheeze, coarse râles and diminished air entry (often localized) with or without signs of pleural effusion. It was observed that the older infants often were still capable of taking some interest in their environment (and bottle), despite obvious respiratory embarrassment and high temperature.

The admission diagnosis was "pneumonia" or "broncho-pneumonia" in 14 cases, "pleural effusion" in two cases, and "tracheo-bronchitis" and "pyrexia of unknown origin" in the two remaining cases.

Throat Swabs.

Coagulase-positive *Staph. aureus* was cultured from only five of the 17 throat swabs taken on admission to hospital.

X-Ray Findings.

Table I gives the frequency of the various findings reported by the radiologists.

TABLE I.

X-Ray Findings in 18 Cases of Staphylococcal Pneumonia.

Reported Finding.	Number of Cases.
Localized or patchy consolidation ..	15
Pleural effusion	12
Cysts	7
Pneumothorax	3
Abscess cavities	3
Atelectasis	3
Emphysematous bulla	1
Tension cyst	1

Treatment.

The 18 patients were under the care of several practitioners, and there was no set routine of treatment. Various antibiotics and combinations of antibiotics were used to counteract the infection. In seven cases empyema was treated by pleural catheterization and underwater drainage. In four of these latter cases broncho-pleural fistulæ developed, but did not warrant any specific treatment. In one case the thick fibrinous nature of the pus necessitated thoracotomy and decortication.

Results.

There were no deaths in the cases under review, and in no case was there reason to suggest any chronic disability after the patients' discharge from hospital.

Discussion.

The increasing frequency of staphylococcal infection of the lungs and pleura in infants has been remarked upon in Britain (Disney, 1956), in Canada (MacKenzie, 1956) and in America (Pryles, 1958), as well as in Australia (Wallman, 1955; Harley, 1957). This increase has followed the widespread general usage of antibiotics — in the period 1922 to early 1944, only 29 cases were seen in a large New York children's hospital (Riley, 1944) — and the subsequent assumption of the role of the "staphylococcal sewer" (Leading Article, 1958) by the maternity hospital. It is in this institution that asymptomatic or symptomatic infection is acquired. The organism is then carried in the upper respiratory passages for a varying period of time, until some factor, perhaps an infection of the upper respiratory passages, lowers the resistance of the host, allowing spread of the virulent organism to the lungs, pleura and, possibly, other sites of the body (bones, meninges, etc.).

Investigating the epidemiology of staphylococcal infection in a maternity hospital, Gillespie (1958) found that most infants became staphylococcal carriers (in the nose, umbilicus or groin) before they were two days old; 88% were nasal carriers at the time of discharge from hospital (aged 10 days), although most had remained asymptomatic. Timbury and her co-workers (1958) found that seven out of 10 babies investigated four months after their discharge, still harboured the staphylococcus acquired in hospital. That this same staphylococcus may persist further into childhood has been suggested by Roy *et alii* (1957), who found a significantly higher incidence of antibiotic-resistant staphylococci, similar to those prevalent in the maternity hospitals, in pædiatric patients compared with corresponding adult patients.

Ravenholt (1957) traced the infants born in Seattle in the month of October, 1956. He found a high incidence of staphylococcal infections (of phage type similar to that in the maternity hospitals), developing in the period following their discharge from hospital. In this group there were 41 deaths under the age of three months, and staphylococcal disease was proved in five of these (pneumonia in two cases and osteomyelitis, mastitis and meningitis in one case each). It was thought that other unclassified "pneumonia deaths" might also have been staphylococcal in nature. None of the staphylococcal deaths took place in the hospital of birth; this indicates that the fatal infection manifested itself after the patient's discharge from the maternity hospital, where the causal organism originally had been acquired.

In an investigation of a staphylococcal outbreak in a maternity hospital in Scotland, Timbury (1958), found that 21 of 99 infants developed staphylococcal infections after their discharge from the hospital.

Hence, to counteract the increasing frequency of staphylococcal pneumonia, two measures are of prime importance. (i) A more restrained use of antibiotics, and in particular those of broad spectrum, would help to prevent emergence of further strains of resistant staphylococci. The danger to public health of continued irresponsible exhibition of these drugs has been compared with a communal water supply polluted by a typhoid carrier (Leading Article, 1958). (ii) Rigorous aseptic precautions are essential in the maternity hospital, if the infant is to avoid acquisition of the staphylococcus in the neonatal period. An important starting point is to ensure that carriers of the infecting organism do not remain on duty. No prophylactic procedure is likely to be effective until such persons are detected and treated (Rountree and Freeman, 1955).

The hospital staff should realize that, as far as the risk of future infection is concerned, asymptomatic nasal carriage is almost as dangerous as frank neonatal infection (Monro and Markham, 1958). "Sticky" eyes, skin pustules and other visible forms of neonatal staphylococcal infection are of minor importance compared with the morbidity and mortality associated with the staphylococcal infections which may manifest themselves only some time after discharge from the maternity hospital.

The diagnosis of staphylococcal pneumonia should be the provisional diagnosis for any infant born in a maternity hospital who, subsequent to an apparent infection of the upper respiratory passages, develops laboured respirations, generalized wheeze, persistent pyrexia and, in particular, signs of pleural effusion. MacKenzie (1956) noted the frequent association of staphylococcal empyema with clinically and radiologically demonstrable gaseous distension of the whole bowel, which may persist for days. Confirmation of the clinical diagnosis of staphylococcal pneumonia will depend on the usually prolonged clinical course, and on the X-ray and bacteriological findings.

TABLE II.

Infants with Staphylococcal Pneumonia without Empyema.

Case Number.	Age of Patient.	X-Ray Findings Supporting Diagnosis of Staphylococcal Pneumonia.	Stay in Hospital. (Weeks.)	Subsequent Throat Swabs.[1]		
				Organism and Period after Admission to Hospital.	Sensitive to.	Insensitive to.
I	2 weeks.	Patchy consolidation, pneumorthoax, pleural effusion.	3			
II	2 weeks.	Patchy consolidation, areas of collapse, pleural effusion.	9	Eight weeks, coagulase-positive staphylococcus.	C.	P, Au, T, Ac.
III	8 months.	Persistent patchy consolidation.	8	Five weeks, coagulase-positive staphylococcus.	Au, T, C, Ac.	P.
IV	2 years.	Patchy consolidation, collapse, pleural effusion, "cysts".	6			
V	11 months.	Patchy consolidation, "cysts", pleural effusion, large cyst.	10	Four weeks, pneumococcus. Ten weeks, coagulase-negative staphylococcus. Pneumococcus.	Au, T, C, A. P, Au. C.	P. T, C, A. P, Au, T, Ac.
VI	3 months.	Consolidation, pleural effusion, "cyst".	5	One week, coagulase-positive staphylococcus. Three weeks, pneumococcus.	Alb. P, Au, T, C.	P, Au, T, C. Ac, E.
VII	2 months.	Patchy consolidation.[2]	4			
VIII	5 months.	Consolidation, abscess cavity, emphysematous bulla.	8	Two weeks, coagulase-negative staphylococcus.	Au, T, C, Ac.	P.
IX	5 months.	Patchy consolidation, pleural effusion.	2	Two weeks, pneumococcus.	Au, T, C, Ac.	P.
X	7 weeks.	Consolidation, abscess cavity, pleural effusion.	2			
XI	5 months.	Patchy consolidation, abscess cavities, atelectasis.	2			

[1] Ac, "Achromycin"; Alb, "Albamycin"; Au, "Aureomycin"; C, "Chloromycetin"; E, erythromycin; P, penicillin; St, streptomycin; T, "Terramycin".

[2] From Royal Alexandra Hospital for Children, after four weeks' treatment.

There is a need to examine radiologically all suspected infants without unnecessary delay, as an aid both to diagnosis and to the locating of any collection of pus in the pleural cavity. X-ray findings that support the diagnosis are localized pneumonia, early pleural space lesions, multiple abscesses (especially in the lower lobes) and cysts (pneumatoceles).

Disney *et alii* (1956) found that, in an infant aged less than two years, the presence of localized pneumonia made the odds three to one in favour of a staphylococcal ætiology. When there is an associated pleural effusion, the possibility is even greater.

Cysts (pneumatoceles) are almost diagnostic of the condition. These are believed to evolve when peribronchial abscesses perforate the bronchial walls and allow air to enter the pulmonary interstitial tissue (Campbell, 1954). When there is an associated check-valve mechanism, emphysematous inflation and the formation of a tension cyst may follow.

Frequent repetition of chest X-ray examinations is needed to detect rapid changes in lung pathology typical of staphylococcal pneumonia (Campbell, 1954; Pryles, 1958). In this series, X-ray examinations were repeated at short intervals only when prompted by clinical changes such as increasing respiratory distress, unexpected rise in temperature and unexplained failure to improve, or by actual deterioration of general condition.

Bacteriological proof of the staphylococcal nature of the pneumonia may be difficult. The routine in this hospital has been for throat swabs to be taken from all patients at the time of admission. These swabs are then cultured and the antibiotic sensitivity is investigated. This has proved of little value in identifying the staphylococcus as the causal organism, for in only five instances was coagulase-positive *Staph. aureus* grown at the time of admission to hospital. Bacterial confirmation was eventually forthcoming in 10 of the remaining 13 patients, either from subsequent throat swabbing or from pleural aspiration. It is interesting to note that in not one of the seven cases of empyema, in which aspiration was later performed and the presence of a staphylococcal infection was proved, did throat swabs give positive findings at the time of admission to hospital.

Because of this lack of satisfactory correlation between the organism cultured from the throat swab and that present in the lungs, some other method of identification is desirable. In the series of Pryles (1958), 87% of cultures of "nasal and/or throat swabs" grew hæmolytic *Staph. aureus*. However, it is not specified from which of the two sites or at what stage of the disease the positive cultures were obtained, and a pure culture was obtained in only four of the 24 cases. Disney (1956) obtained bacteriological confirmation in 22 of 25 infants by means of thoracic puncture at the site of the pneumonic area. If no exudate was obtained, the needle was advanced 1 to 2 cm. into the lung tissue. The success of this harmless procedure depends on the fact that large numbers of bacteria are present early in the disease, and pleural involvement also is an early occurrence. Harley (1957) and Pryles (1958) both found this method efficacious.

Since the advent of antibiotics, infantile staphylococcal pneumonia has not only increased in frequency, but has had some of its features altered and its prognosis dramatically improved.

Staphylococcal pus is generally regarded as being thick, rich in fibrin and with a tendency to become loculated by fibrinous pleural adhesions (Nelson, 1954). Of the seven cases of empyema, in only one (Case XII, Table III) was this type of pus present.

The patient was a girl, aged two years, who had had a right-sided pyopneumothroax treated by drainage nine months previously. After this she had remained symptomless till six weeks prior to the present admission to hospital, when, after an upper respiratory tract infection, she became lethargic and pyrexial and disinclined to lie on her back. Her respirations gradually became more and more laboured, and at the time of her admission to hospital an extensive right-sided empyema was present. It was treated by pleural catheterization and underwater drainage; but the viscid pus repeatedly blocked the apparatus, and eventually an empyema cavity formed. Thoracotomy and decortication were carried out, after which a rapid improve-

ment allowed her discharge from hospital three weeks after operation. At that time the patient was free of symptoms and in good general health.

Of the remaining six cases of empyema, the pus was completely liquid in four and slightly more dense in two. It was white-yellow in colour and often under pressure, so that it tended to spurt out after the removal of the insertion trocar from the cannula. In none of these six cases was there any tendency to loculation of the pus or any difficulty in maintaining a free flow through the catheter.

The fluid nature of the pus in these cases appears to be the result of antibiotic action on the staphylococci. The work of Dixon (1945) suggests that the amount of fibrinolysin released by these bacteria can be altered by the administration of antibiotics under certain circumstances. He found that penicillin inhibits fibrinolysin release by penicillin-sensitive staphylococci, but has no effect on insensitive organisms. The action, if any, of other antibiotics on this mechanism has apparently not yet been determined.

At one time infantile staphylococcal pneumonia was almost inevitably fatal. Although the prognosis has improved greatly, it is still a grave disease. Wallman (1955) reported 10 deaths in his 55 cases, and Harley (1957), seven deaths in 19 cases, and in the three large series discussed by Pryles (1958) mortality rates varied from 37·5% to 54%. Although there were no deaths among the 18 cases discussed in the present paper, in the period under review six infants died as a result of respiratory infection. One of these was the patient with mucoviscidosis, previously mentioned. The other five patients (Table IV) all died within 24 hours of admission to hospital. Autopsy was performed on only one of these (Subject A), and revealed pneumococcal meningitis and pneumonia. Staphylococcal pneumonia could have been present in any or all of the remaining four infants, especially in view of Wallman's report that five of the 10 deaths in his cases occurred within 24 hours of admission to hospital.

Treatment consists of the administration of the appropriate antibiotic, together with surgical procedures when they are indicated. Because of the difficulty of isolating the causal organism, and hence determining its sensitivity, the definition of the "appropriate antibiotic" in the individual case may prove difficult. Penicillin would appear to be very rarely the antibiotic of choice, as in only one instance in these cases was the staphylococcus found to be sensitive to that antibiotic.

As is illustrated in Tables II and III, the only antibiotic of the five tested to which sensitivity was consistently demonstrated was chloramphenicol. This would appear to be the logical antibiotic to use in all suspected cases of staphylococcal pneumonia; but, as Herrell (1958) emphasizes, the proven relationship between the use of chloramphenicol and the development of blood dyscrasia, especially in patients aged less than 12 years, should restrict the use of this antibiotic to staphylococcal infections resistant to other available antibiotics.

Erythromycin and the less effective oleandomycin and spiramycin also fall in this category (Leading Article, 1957).

Various combinations of antibiotics have been suggested for use against the staphylococcus; but the value of these is uncertain (Leading Article, 1957), and is probably no greater than that of the more powerful of the individual drugs used alone.

Several of the cases exemplify the inconsistencies of response to antibiotics in staphylococcal pneumonia.

One example is Case XVI (Table III). This boy, aged 17 months, had been examined by his family doctor five days prior to his admission to hospital because of a "bad cold" with copious rhinorrhœa that caused difficulty in breathing through the nose. At that time his general condition was stated to be good. "Chloromycetin Palmitate", in a dose of 125 mg. every four hours, was prescribed and given conscientiously six doses a day till the time of his admission. Despite this, there was a gradual deterioration in the infant's condition, with increasing dyspnœa, persistent elevation of temperature and frequent cough. On his admission, dyspnœa was marked and the respiratory excursions were short, rapid and grunting in nature. There were clinical and radiological signs of a large right-sided pleural effusion. Ten ounces of milky fluid were aspirated and an intercostal drain was inserted, after which there was immediate symptomatic relief. Culture of the pus grew coagulase-positive *Staph. aureus* sensitive to "Chloromycetin" and the other tested antibiotics, apart from penicillin.

This infant apparently developed staphylococcal empyema even though he was receiving an adequate dosage of the "appropriate" antibiotic.

TABLE III.

Infants with Staphylococcal Pneumonia and Empyema.

Case Number.	Age of Patient. (Months.)	Aspirated Pus (from Empyema). Coagulase-Positive Staphylococcus.[1]	
		Sensitive to.	Insensitive to.
XII	24	Au, T, C, Ac.	P.
XIII	2½	C.	P, Au, T, Ac.
XIV	6	C.	P, Au, T, Ac.
XV	2½	Au, T, C, Ac.	P.
XVI	17	Au, T, C, Ac.	P.
XVII	6	P, Au, T, C, Ac.	—
XVIII	13	Au, T, C, Ac.	P.

[1] Abbreviations as in Table II.

Another example is Case XVII (Table III). This infant, aged six months, was admitted to hospital after two days of mild diarrhœa and occasional vomiting with a high temperature. After admission, the diarrhœa and vomiting settled, but the pyrexia persisted. There were no localizing signs, and X-ray examination of the child's chest on admission did not reveal any evidence of pulmonary disease. The patient was treated with a combination of "Chloromycetin Palmitate" and streptomycin. The "spiking" temperature chart suggested a collection of pus somewhere in the body, and the restlessness, abdominal distension and apparent discomfort on palpation of the right upper abdominal quadrant suggested the possibility of a perinephric collection of pus. Abdominal X-ray examination, apart from gaseous intestinal distension, gave unremarkable findings; but a second X-ray examination of the chest taken two weeks after the child's admission revealed a left pleural effusion. Aspiration produced creamy fluid pus under pressure, and after pleural catherization the infant's condition improved. Culture of the aspirated pus grew a coagulase-positive staphylococcus sensitive to all five antibiotics against which it was tested (penicillin, "Achromycin", "Terramycin", "Chloromycetin", "Aureomycin"). After three days of catheterization there was only a small amount of drainage, and this, together with the marked improvement in the infant's general condition, prompted an early withdrawal of the catheter.

TABLE IV.

Infants Dead within 24 Hours of Admission.

Subject.	Age.	Features.
A	5 weeks.	Refusal of feeds, restlessness, pyrexia. Autopsy: red hepatization, pneumococcal pneumonia.
B	4 days.	Vomiting, not sucking, pyrexia. X-ray film of chest—areas of collapse.
C	9 months.	Diarrhœa, vomiting, toxæmia, pyrexia. Clinical signs of pneumonia.
D	4 weeks.	Respiratory distress, toxæmia, pyrexia. Clinical signs of pneumonia.
E	12 months.	Second degree burn of hand (10 days). Pyrexia, respiratory distress, poor air exchange.

At this stage the attending doctor altered the antibiotic to erythromycin. Two weeks later the infant once more became pyrexial, and X-ray examination revealed a further collection of fluid in the left pleural space necessitating further aspiration. This time the pus was thicker in nature, but was still easily aspirated.

Here again, the infection appears to have advanced in the face of therapy with antibiotics to which the causal organism was sensitive.

An important feature of the management of this disease is a continual seeking for any collection of pus in the pleural space. If this is suspected on clinical grounds, it can be confirmed by X-ray examination and then by aspiration. When the diagnosis of empyema is established, prompt pleural catheterization and underwater drainage are usually followed by relief of distress and the commencement of cure.

The enzymes streptokinase and streptodornase are suggested by Nelson (1954) and MacKenzie (1956) as an aid to removing the thick staphylococcal pus from the pleural space, but these were not necessary in the present series.

Summary.

Eighteen cases of a severe illness diagnosed as staphylococcal pneumonia occurring in a children's ward over a period of 20 months are presented.

The increased incidence of this disease and its relationship to the widespread use of antibiotics, and the subsequent reservoir of antibiotic-resistant staphylococci in maternity hospitals are discussed.

Certain aspects of the clinical features, X-ray findings, bacteriological procedures, and treatment of the disease are described.

Acknowledgements.

I should like to thank Sister Mary Saint Rock, of the children's ward, and the medical staff of the Mater Hospital, Newcastle, for their assistance in compiling the details of the cases in this series.

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STAPHYLOCOCCAL INFECTION IN INFANCY.[1][2]

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IN September, 1958, the New South Wales Department of Public Health added staphylococcal infections to its list of notifiable infectious disease. The actual wording is as follows: staphylococcal mastitis; staphylococcal pneumonia; staphylococcal infections occurring in infants under four weeks. It appears that this has been done on the recommendation of the New South Wales Branch of the British Medical Association, as a result of the serious situation which arose last winter with staphylococcal infections, and which seems likely to rise again.

During the many months that Dr. P. M. Rountree, Professor Lorimer Dods, Professor B. T. Mayes, Dr. C. E. A. Cook and I spent preparing the booklet on "Staphylococcal Infection in Maternity Hospitals" for the National Health and Medical Research Council (1956), we all became acutely aware of the need for some action that would assist the Health Department to detect the main sources of infection. Notification of breast abscesses, staphylococcal pneumonia and deaths from staphylococcal infections seemed a matter of urgency if suitable action was to be taken to control this infection. The main reservoirs of virulent epidemic strains of staphylococci in the community are the maternity hospitals (Battersby and Striger, 1954); but I have never considered it a practicable proposition to make infections of the neonates notifiable in this sweeping fashion, because of difficulties of diagnosis, and because of the fact that the more serious manifestations, such as osteomyelitis, occur immediately after the neonatal period. However, the law must be obeyed and may solve a difficult problem, so let us try to decide what has to be notified.

It will only waste your time and mine to hear me describe the clinical infections caused by the Staphylococcus in the new-born. I, and others, have done this *ad nauseam*, so let me make a few observations.

1. The clinical manifestations of infection in the first two weeks of life may be very unimpressive, owing to the baby's apparent inability to localize infection very well; therefore, quite trivial lesions must be treated with respect.

2. It is rare for any serious staphylococcal infection to occur in the first month without having been preceded by a minor infection or some factor that temporarily lowers the baby's resistance to infection. (I consider that circumcision may be such a factor.)

3. The common infections of the first two weeks are conjunctivitis, pustular rashes, paronychia, naso-pharyngitis with purulent discharge, redness of or discharge from the umbilicus, otitis media, infected skin abrasions and indurated areas in skin.

4. The more serious infections tending to occur a little later (second to seventh week) are abscesses, cellulitis, osteomyelitis, osteitis and septic arthritis, pneumonia, pyelonephritis (the latter being insidious and, like otitis media, very easy to miss).

5. The treatment still remains as in the National Health and Medical Research Council's "blue booklet", mentioned earlier; but hexachlorophene is now being widely used as "pHisoHex" baths, and "Hibitane" ointment seems as effective as the local application of antibiotics and probably wiser treatment. Any baby showing general symptoms, such as refusal to feed, lethargy, pyrexia, jaundice or rapid respiration in association with a local lesion will usually require antibiotics administered by mouth or parenterally; septicæmia and multiple blood-borne abscesses are always a possibility.

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on April 30, 1959.

[2] For Figures I to IV see art-paper supplement.

In the new-born, coagulase-positive staphylococci can be cultured from the nose, umbilicus and skin in a large percentage of cases in which no clinical lesion is present (Forfar *et alii*, 1953); Isbister *et alii*, 1954).

It seems to me that all clinical lesions from which coagulase-positive staphylococci can be cultured must be considered notifiable. However, where no pathology facilities are available, it will be necessary to notify clinical infections that may reasonably be considered staphylococcal. This becomes a matter of the clinical judgement of the doctor in charge of the case, and there is abundant evidence to suggest that only those doctors constantly caring for the new-born are fully aware of the clinical manifestations. Therefore, it seems to me that it is necessary to notify according to the list prepared in the National Health and Medical Research Council's booklet, or to have that list simplified by the pædiatricians working in the teaching maternity hospitals.

Staphylococcal Pneumonia.

The other notifiable staphylococcal infection to be considered is staphylococcal pneumonia, and this, too, presents a problem in diagnosis. In an effort to determine what degree of accuracy we are obtaining at Royal North Shore Hospital, and also to give an idea of what may reasonably be considered staphylococcal pneumonia on clinical grounds, I went through the records of the hospital for the past two years, and examined those of all children aged two years and under. Three years ago Dr. R. H. Vines and I collected a number of cases of staphylococcal pneumonia in infancy and prepared them for publication; but two other excellent papers appeared in THE MEDICAL JOURNAL OF AUSTRALIA about that time which demonstrated the clinical picture so well that we did not submit ours for publication, and I shall add them now to the more recent ones. From the 22 patients aged under three years so selected, I am presenting five very different clinical pictures, all of proven staphylococcal origin.

CASE I.—This was a case of acute fulminating staphylococcal pneumonia possibly associated with influenza. Baby A., aged eight months, was well, gaining weight and feeding well until 36 hours before her admission to hospital, when she was observed to have a cold and to be "croupy". She had a restless night, with difficulty in breathing relieved somewhat by steam, but grew worse next day and was admitted to Royal North Shore Hospital. On her admission she was pale and slightly cyanosed, her respiratory rate was 90 per minute, her temperature was 104° F., and stridor and chest recession were present. A tracheotomy was performed with some relief, and she received full doses of "Chloromycetin" and "Erythrocin". The following day her respiratory rate increased, tachycardia became more marked, her condition deteriorated and she died. X-ray examination of the chest showed faint mottling of both lungs. A post-mortem examination revealed extensive hæmorrhagic consolidation of both lungs of virus type, and hæmolytic *Staphylococcus aureus* phage Type 80 was grown from the lung in pure culture.

CASE II.—This was a case of acute bilateral suppurative bronchopneumonia. Baby B., aged two weeks, was born in a maternity hospital which had had several mothers with breast abscesses about that time. He was a full-term second baby weighing 8 lb., and was normal for the first week. He was circumcised on the sixth day, and two days later was found to have a breast abscess, which was incised and treated systemically with chloramphenicol. After recovery he was admitted to a mothercraft home, and appeared normal on admission; he was sleepy, though feeding well. The next day he was slow to feed, vomited a feed and had a distended abdomen, and his respiratory rate was observed to be 80 per minute and his temperature 102° F. He was not cyanosed, but a few transient crepitations were heard at the bases of the lungs. He was admitted to Royal North Shore Hospital, and "Aureomycin" therapy was commenced. It is worthy of note that a good resident medical officer observed that "he looks as if he has nothing wrong with him and certainly hasn't pneumonia". X-ray examination of the baby on his admission to hospital was reported to reveal no abnormality. Intensive antibiotic therapy was given with streptomycin and "Aureomycin" and later erythromycin, as the diagnosis was considered to be pneumonia. However, abdominal distension increased, there were no bowel actions and the abdomen was "silent". Paralytic ileus was treated by stomach aspiration and the intravenous administration of fluid. Bowel action returned and oral feeding was resumed. The child appeared to be improving and then developed œdema, ascites, tachycardia and increased respiratory embarrassment, and died on the fifth day of illness of cardiac failure. A post-mortem examination revealed multiple abscesses in both lungs. Both pleural cavities contained thick pus coating the pleura and forming adhesions. Microscopic examination of sections revealed acute suppurative pneumonia with clumps of cocci in the lung. Culture from lung produced a hæmolytic *Staph. aureus* phage type 80, resistant to tetracycline and penicillin.

CASE III.—This was a case of acute suppurative bronchopneumonia, localized and uncomplicated, one side being predominantly affected. Baby C., aged five weeks, had a history of abscesses since the age of two weeks following skin pustules. The child was pale and lethargic, refusing to feed, and passed a loose green stool; the temperature was 95° F. on the first examination. The patient made a slow recovery on "Aureomycin" therapy, and required tube feeding and good nursing. X-ray examination revealed a localized pneumonic lesion in one lung.

CASE IV.—In this case localized lesions were followed by cyst formation. Baby D., aged five months, had been normal at birth, and had no history of local infection, but she had a sudden episode of high fever and rapid respiratory rate at the age of two weeks, when she was admitted to the Royal Alexandra Hospital, and treated with antibiotics, an X-ray examination of her chest revealing no abnormality. She remained well until the age of five months, when she suddenly became desperately ill, with a temperature of 105° F., rapid grunting respiration and cough, vomiting and loose green stools; she was treated with "Terramycin" with little improvement and admitted to the Royal North Shore Hospital on the fifth day of illness. She was pale and cyanosed, her abdomen was distended, her temperature was 102° F., and the slightest exertion precipitated a cyanotic attack with acute respiratory distress. An X-ray examination of the chest revealed a large tension cyst or pneumothorax on the right side, and suggested the presence of some pneumonic process in the collapsed lung. The chest was needled as necessary to relieve respiratory distress, and pus and air escaped; 10 days later it became necessary to drain an empyema. The child steadily improved, and was discharged from hospital, apparently cured, three months after her admission.

It seems probable that this was a case of an infected tension cyst persisting from the first attack. Phage type 80 hæmolytic *Staph. aureus* was cultured from empyema fluid.

CASE V.—This case was one of pneumonia with empyema formation. A male patient, aged two and a half years, had a history of a cold with purulent nasal discharge for two weeks; this had commenced after his mother returned from the maternity hospital with a new-born baby with a pustular rash. The illness had a sudden onset, with rigor, breathlessness and cyanosis. He was sent down to Royal North Shore Hospital from a country town for the treatment of empyema; his mother came down with him, and was treated for a very large breast abscess. The empyema was drained, and he slowly recovered with wide-spectrum antibiotic therapy. Hæmolytic *Staph. aureus* was recovered from the empyema fluid and from the mother's breast abscess. It was reported not typable, but the breast abscess was identical with those caused by phage type 80, and at this time Dr. Rountree was unable to identify phage type 80.

One of Dr. Vines's cases is almost identical, except that the six weeks old baby died suddenly after an illness of 48 hours' duration believed to be pneumonia. The mother had a breast abscess and the two-year-old baby had pneumonia.

Discussion.

Of the 22 cases of staphylococcal pneumonia considered proved, there were two patients with acute fulminating pneumonia who died in the first two days of their illness, one aged eight months and the other nine months. There were three neonates with acute bilateral suppurative bronchopneumonia, and all three died. There were 16 patients whose X-ray films showed unilateral lesions, of whom nine had empyemas with or without cysts, and one cyst formation without empyema. One of these died at the age of 21 months, and was found to have bilateral pneumonia on post-mortem examination. A twenty-third

ILLUSTRATIONS TO THE ARTICLE BY CLAIR ISBISTER.

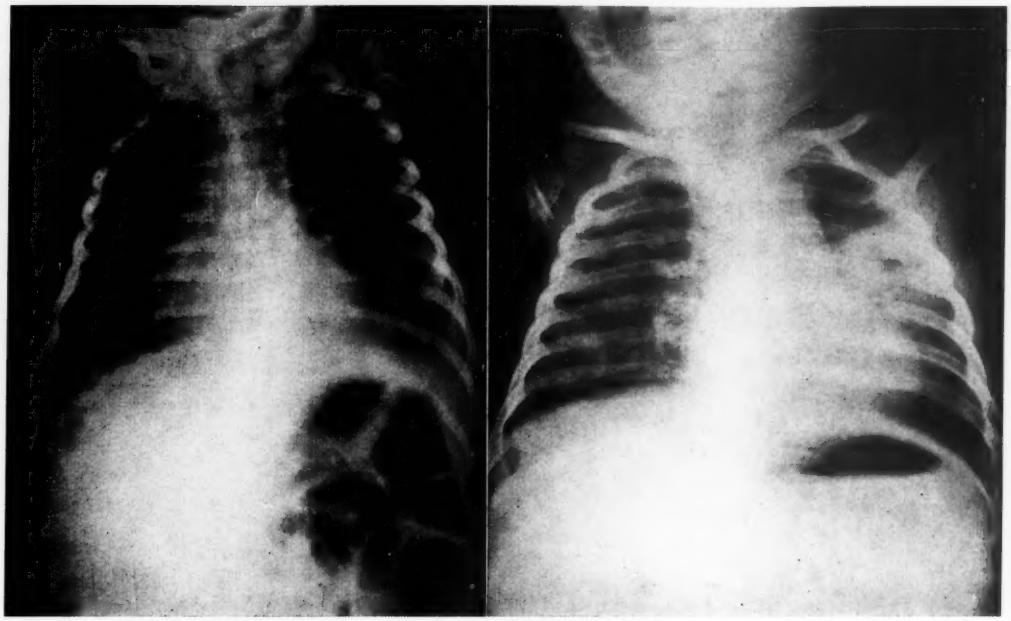


FIGURE I.—X-ray film was reported "normal", later considered to show emphysema. Note distended bowel. This baby died two days later from extensive bilateral suppurative pneumonia, and had paralytic ileus. FIGURE II.—Consolidation of upper lobe of left lung, with localized area in lower lobe of right lung.

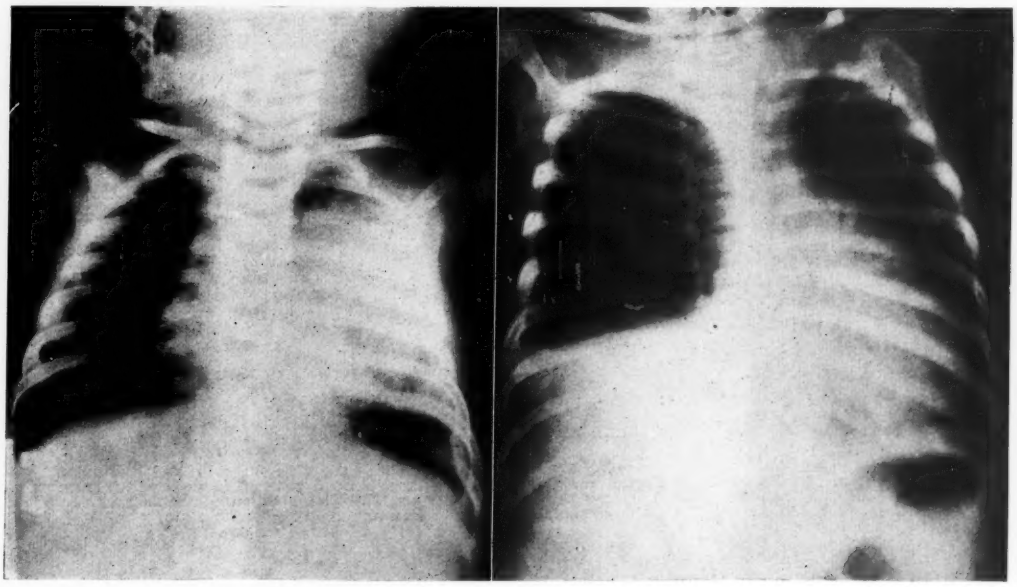


FIGURE III.—Both areas progressed to cyst formation. FIGURE IV.—Large infected tension cyst and pneumothorax with early empyema.

ILLUSTRATIONS TO THE ARTICLE BY B. J. PASCOE AND A. E. McGUINNESS.

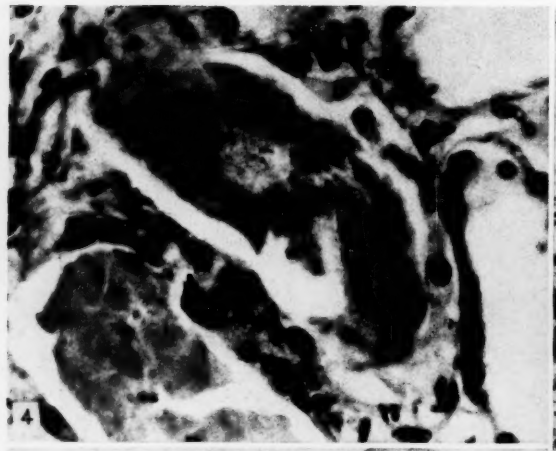


FIGURE IV.—Regenerating tubular epithelium in tubules containing hæmoglobin cast. (Hæmatoxylin and eosin stain, × 486.)
FIGURE V.—Cross section of sella turcica and pituitary gland, showing large central zone of necrosis with a narrow rim of viable anterior lobe cells. (Hæmatoxylin and eosin stain, × 5·5.) FIGURE VI.—The junction of viable and necrotic areas with an intervening zone of vascular granulation tissue. (Hæmatoxylin and eosin stain, × 240.)

ILLUSTRATIONS TO THE ARTICLE BY M. F. RIDLEY AND T. A. NOWELL.

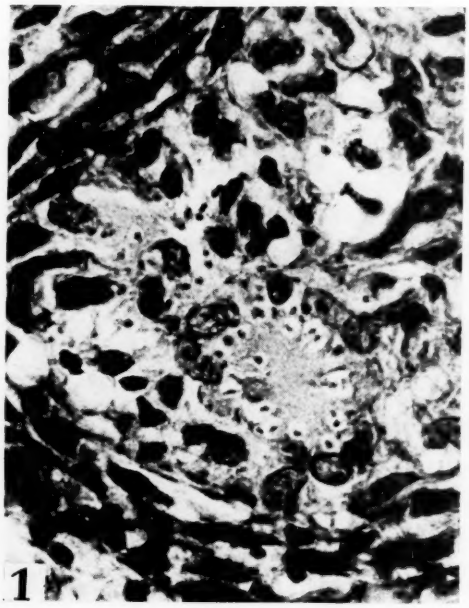


FIGURE I.
Section of the lesion (hæmatoxylin and eosin stain, × 780).

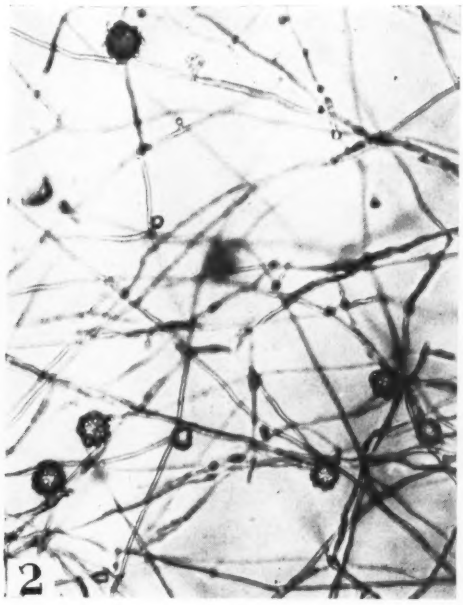
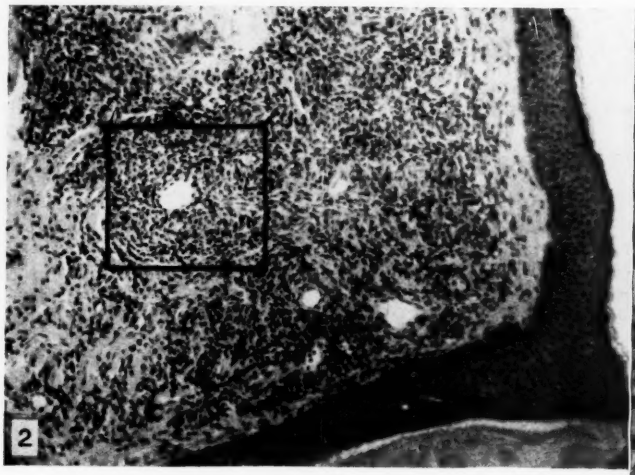


FIGURE II.
H. capsulatum: slide culture after 10 days at room temperature on corn-meal agar (× 470).

ILLUSTRATIONS TO THE ARTICLE BY Q. J. TAPERELL.



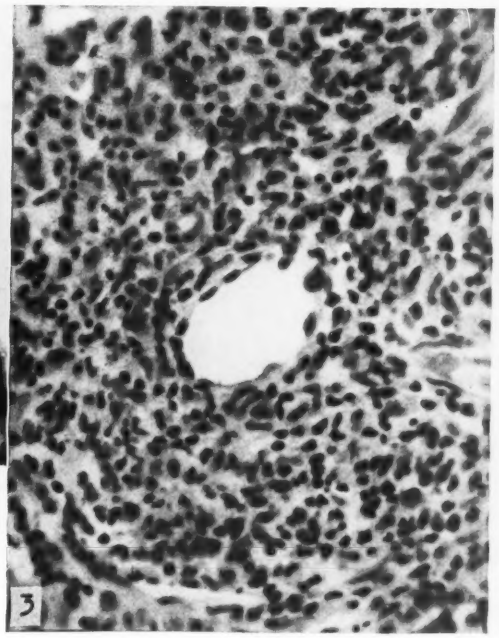


FIGURE II.—Part of the lesion (hæmatoxylin and eosin stain, × 120). *The sub-epidermal zone is clear of infiltrate. In the dense* cellular mass occupying the upper part of the corium there are several vessels which are dilated, the infiltrate being clearly perivascular in the lowest vessel. FIGURE III.—Higher power photograph of the inset in Figure II (× 476). Note the thin endothelial wall, surrounded by a thick cuff of neutrophils, many with nuclear fragmentation, eosinophils, lymphocytes and histiocytes.

ILLUSTRATIONS TO THE ARTICLE BY E. V. MACKAY.

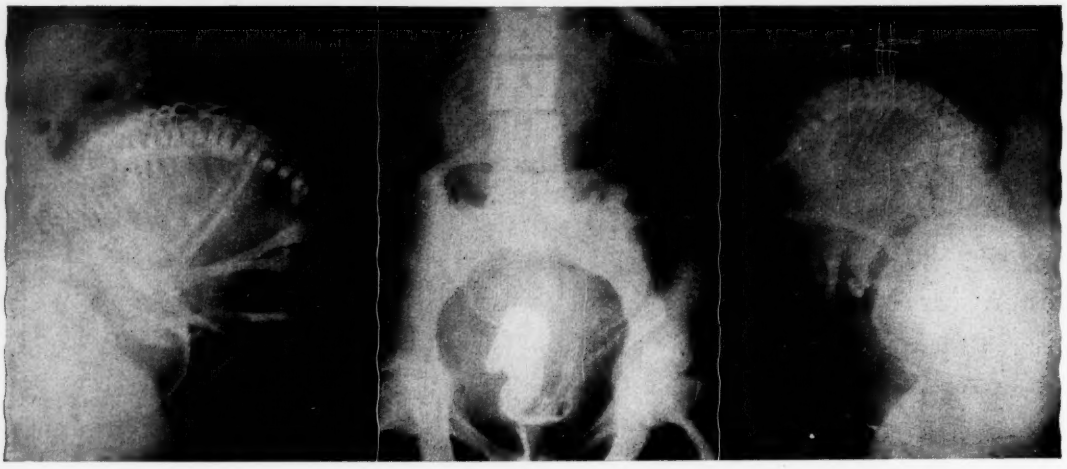


FIGURE I. FIGURE II*a*. FIGURE II*b*.

ILLUSTRATIONS TO THE ARTICLE BY I. H. F. SWAIN AND R. OSMOND.

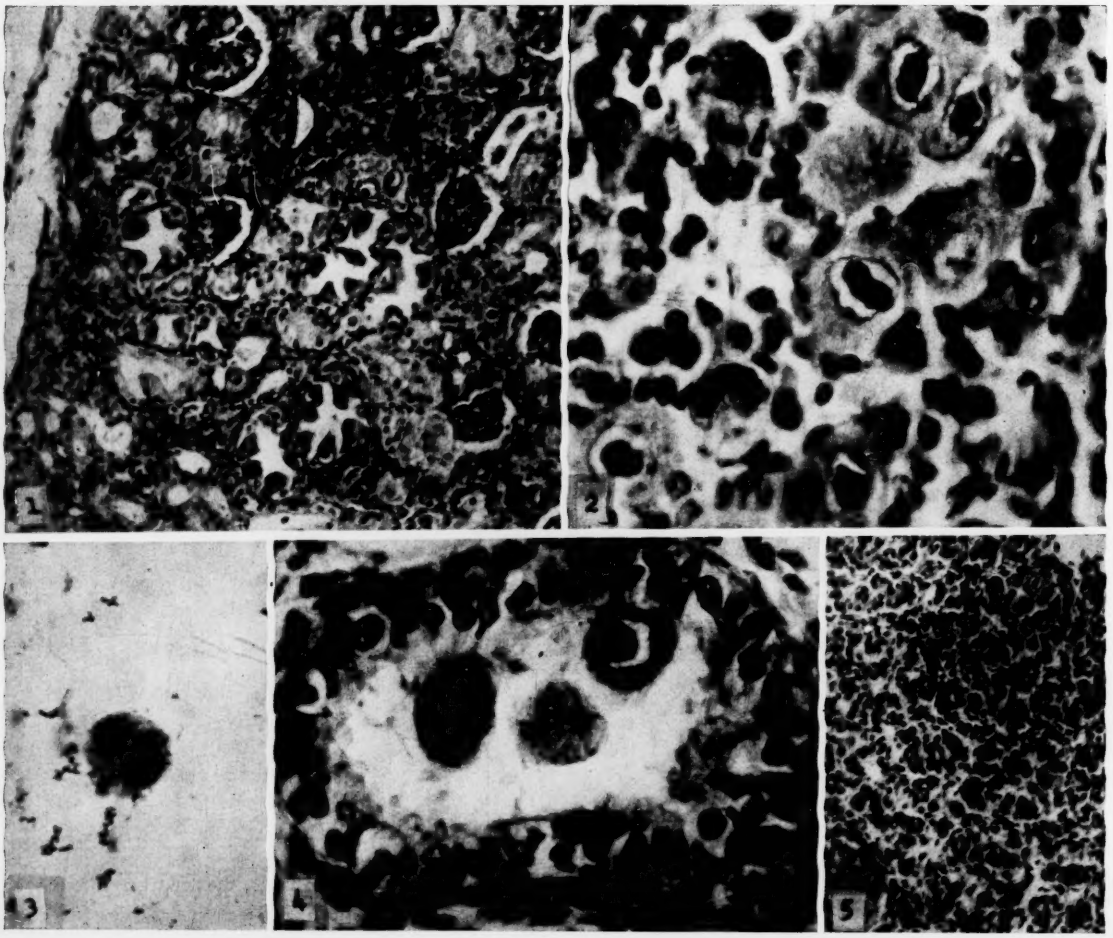


TABLE I.

22 Cases of Staphylococcal Pneumonia.

Patient's Age.	Sex.	Predisposing Factors.	Complication.	Pathological Findings.[1]	Treatment.	Outcome.
21 months.	M.	Local skin infection; infantile eczema.	Septicæmia.	H.S.A. in sputum.	"Chloromycetin."	Bilateral; died.
4 months.	F.	Nasal discharge.	Nil.	H.S.A. in sputum.	Penicillin, streptomycin.	Unilateral; recovered.
3 months.	M.	Local boils.	Otitis media.	H.S.A. in ear and pustules.	"Achromycin."	Recovered.
9 months.	M.	Infantile eczema, on cortisone; croup.	Septicæmia.	H.S.A. in lung and larynx.	"Chloromycetin."	Bilateral; died.
2 weeks.	M.	Circumcision.	Septicæmia, myocarditis.	H.S.A. in lung.	"Chloromycetin."	Bilateral; died.
2 years.	F.	——	Lung cysts.	H.S.A. in larynx.	"Chloromycetin."	Unilateral; recovered.
2 years.	F.	Pustules.	——	H.S.A. in pustules.	"Achromycin."	Unilateral; recovered.
7½ weeks.	M.	——	Cysts, empyema, pneumothorax.	H.S.A. in nose and larynx.	"Erythrocin", "Chloromycetin".	Unilateral; recovered.
8 months.	F.	Croup; septicæmia.	——	H.S.A. in lung.	"Chloromycetin", "Erythrocin".	Bilateral; died.
16 months.	M.	In hospital.	Pneumothorax, empyema.	H.S.A. in empyema fluid.	"Aureomycin."	Unilateral; recovered.
4 weeks.	M.	Circumcision in maternity hospital.	Empyema.	H.S.A. in empyema fluid.	"Chloromycetin."	Unilateral; recovered.
2 weeks.	M.	Circumcision in maternity hospital.	Empyema, cysts.	——	"Chloromycetin."	Unilateral; recovered.
7 weeks.	M.	Circumcision in maternity hospital; mother had boil, baby pustules.	Pneumatocele, cardiac failure.	H.S.A. in laryngeal swab.	"Aureomycin."	Unilateral; recovered.
2½ years.	M.	New baby aged 6 weeks, died of pneumonia; brother, aged 18 months, had pneumonia.	Empyema, pneumatocele.	H.S.A. in empyema fluid.	"Aureomycin."	Unilateral; recovered.
2 months.	M.	In hospital.	Empyema.	H.S.A. in empyema fluid.	"Aureomycin."	Unilateral; recovered.
2 weeks.	F.	Pustules, abscesses in maternity hospital.	Bilateral lung abscesses.	H.S.A. in lung.	"Aureomycin."	Died.
5 weeks.	M.	Local abscess.	——	——	"Aureomycin."	Unilateral; recovered.
5 months.	F.	Lung cyst from pneumonia.	Pneumothorax, empyema.	H.S.A. in empyema fluid.	"Achromycin", streptomycin.	Unilateral; recovered.
2 weeks.	M.	Circumcision in maternity hospital; local abscess.	Multiple lung abscesses, cardiac failure.	H.S.A. in lung.	"Aureomycin."	Bilateral; died.
4 weeks.	F.	Mouth ulcer.	Empyema, cysts.	H.S.A. in larynx.	——	Bilateral; recovered.
9 months.	M.	Institution child.	Empyema.	H.S.A.	"Aureomycin."	Unilateral; recovered.
2 years.	M.	Baby brother had pustules, mother breast abscess.	Empyema.	H.S.A. in empyema fluid.	"Aureomycin", streptomycin.	Unilateral; recovered.

[1] Hæmolytic *Staph. aureus*, resistant to penicillin in every case.

patient, aged three years, had localized pneumonia with cyst formation.

Predisposing Factors.

Nine babies out of 22 were aged under two months (two female, seven male). Five had been circumcised, either while clinical infection was present, or certainly while they were still nasal and umbilical carriers (no record in two other cases).

Seventeen of the 22 cases could be traced to hospital infection; the mothers of two of the two-year-old children had babies just home from maternity hospital with clinical infection; and the other patients had recently left hospital or had recurrent infections since leaving the maternity hospital (the history was not complete in the case of some of the older babies).

In eight of the nine patients aged under two months, local skin lesions or conjunctivitis had been present; the ninth had been circumcised, and it was reported that there had been infections among the babies in that hospital. Three of the older children had staphylococcal skin lesions, and one with infantile eczema was apparently free of skin infection, but was having an antibiotic ointment applied.

Clinical Observations.

In the nine patients aged under two months, the onset was insidious; the mother had usually been aware for several days that something was wrong, but for the examining doctor there had been little to indicate that within 24 hours the baby would be fighting for its life with a pulmonary infection that was already present. In the two fulminating cases the babies had been quite well, and the onset was sudden with cold, nasal discharge and croup, progressing to chest recession and extreme toxæmia.

In the babies aged under two months, difficulty with feeding was the first symptom. All were lethargic and quiet, crying weakly, and the respiratory rate was rapid (50 to 100 per minute), the respirations often being grunting in type. There was little or no cough, pyrexia was variable, tachycardia and slight cyanosis were usual, and abdominal symptoms such as distension, vomiting and the passing of green motions were common. The clinical signs were variable, difficult to identify and amazingly sparse when compared with the lesions found *post mortem*, fine crepitations being the most common and reliable sign. Purulent nasal exudate was not a feature, though several mothers observed that the baby had been snuffly or croupy.

X-ray Findings.

X-ray examination was not very helpful in the early stages, and it is extremely doubtful whether it is justifiable to disturb a baby who is likely to collapse and die, before he has had intensive antibiotic therapy for at least 24 hours. The earliest X-ray films showed emphysema only, and it was not recognized at the time, the findings being reported as normal. Caffey remarks:

> The frequency and importance of regional emphysema in acute respiratory infection have not been generally appreciated. The normal check valve effect in normal respiration is readily exaggerated by the local occlusive actions of inflammatory exudate and mucosal swelling and in severe cases the alveolar walls may rupture. The coalescence of the dilated ruptured alveoli may give rise to large cavities (pulmonary bullæ) surrounded by peripheral strips of compression atelectasis (ring shadows).

Two patients showed lesions more like ping-pong balls, that later cleared in the centre leaving cysts. Some showed diffuse fine mottling, others cotton-wool patches, patches suggesting emphysema, pneumothorax and tension cysts with and without fluid levels. A narrow linear opaque area spreading up from the costo-phrenic angle along the inner margin of the ribs and presumably due to pleural fluid was seen in some cases. In two instances the baby was dead before the radiologist was prepared to make a diagnosis, and extensive lesions of bilateral suppurative bronchopneumonia were present *post mortem*.

Pathological Findings.

In six cases hæmolytic *Staph. aureus* was obtained from empyema fluid; it was obtained from the lung of five babies who died, and from sputum or laryngeal swabs in seven cases. (In two cases in which nasal and laryngeal swabs were taken, it was the nasal swab that yielded phage type 80, the same as the lung lesion, when the organisms from the laryngeal swab were a different strain.) The remaining three babies had local abscesses from which cultures had not been taken.

Treatment.

The initial diagnosis is a clinical one, and the fate of the young babies depends on the speed and effectiveness of the first antibiotic therapy; penicillin is useless, except possibly in enormous doses. "Chloromycetin" and "Erythrocin" together seem at present drugs of choice given parenterally. Prevention alone could have saved the three neonates who died; two were circumcised while they had clinical lesions, and the third had untreated skin infection for at least a week before the onset of severe symptoms.

Very good nursing is essential; gentle handling, minimum washing, tube-feeding or an indwelling polythene catheter for feeding—all may mean the difference between life and death. Surgical interference should be kept to a minimum, and cysts should be needled only for acute respiratory distress. Small empyemas will resolve, and larger ones rarely need open drainage. It takes very little handling to kill these babies. Physiotherapy in the convalescent stage and posturing assist drainage. Cysts take months to disappear, but the patients who had cysts have been followed and have no residual symptoms, and the cysts have disappeared radiologically.

Staphylococcal pneumonia is a long, severe illness; all these children were desperately ill, and six of the 21 died. In three cases relapses occurred when antibiotics were stopped too soon, and in one case large doses of penicillin were continued for four months after the discontinuation of wide-spectrum antibiotics. It is probable that antibiotics should be administered until there is no fever or leucocytosis, the baby is gaining in weight and the erythrocyte sedimentation rate is normal, though it may be advisable to change from chloramphenicol.

Reliability of Diagnosis for Notification Purposes.

In the last two years, 69 children were admitted to the Royal North Shore Hospital with pneumonia, all aged less than three years. There were 39 between the ages of one and three years and 30 aged under one year, and of these 12 were aged under three months. The 30 cases in the under one year group were carefully analysed. Of the nine cases considered to be proved staphylococcal pneumonia, in six positive cultures were obtained either from the lung *post mortem* or from empyema fluid. The remaining three patients were extremely ill, fitting the clinical picture already described with lung consolidation. A laryngeal swab of one of these yielded a hæmolytic *Staph. aureus*, and nasal swabs from the two others yielded positive findings and they had local staphylococcal lesions. Another, aged eight months, died of an acute fulminating illness resembling that in Case I, but no post-mortem examination was allowed, and the condition was almost certainly the same. Of the remaining nine babies aged under three months, four were extremely ill, with X-ray evidence of lung consolidation and harbouring hæmolytic *Staph. aureus* in either the nose or the larynx. Two others had local staphylococcal lesions with severe pneumonia. Two others again were moderately ill; both were aged five weeks, and were promptly treated wiht wide-spectrum antibiotics before swabs were taken and examined with negative results. The remaining baby had pneumonia and relapsed, and had to be readmitted to hospital for another longer course of antibiotic therapy. It seems to me that all these babies probably had staphylococcal pneumonia; that is, of 12 babies aged under three months, three were proved to have it and nine probably had it.

When the older age groups are considered, the diagnosis becomes more difficult; but it seems certain that some of those with consolidation only, which resolved with prompt wide-spectrum antibiotic treatment, could have had staphylococcal pneumonia; that is, of 18 babies aged between three months and one year, six were proved to have it and three probably had it. Thus, of 30 babies aged under one year, nine had proved to have and 12 probably had staphylococcal infections.

The diagnosis depends on the following factors. (i) The clinical picture. This can be variable, as has been illustrated; but in all cases marked toxæmia was apparent. (ii) X-ray evidence. Cyst formation and pneumothorax and empyema are satisfactory evidence, but local or scattered areas of consolidation require further confirmatory evidence. (iii) The pathological findings. Culture of the organism from lung or empyema fluid is proof, and positive findings in nasal and laryngeal swabs are very suggestive in a very sick child. (iv) Suspicion of staphylococcal pneumonia. This should be aroused by evidence of local skin or other staphylococcal infection, a history of recent staphylococcal infection, recent association with a patient with clinical infection or contact with patients recently discharged from a maternity hospital, or relapse after cessation of antibiotic therapy. Any baby under three months old with pneumonia should be treated as having staphylococcal pneumonia, and the disease must be suspected in all aged under 12 months.

For the purposes of notification, it seems that either one notifies proved cases only, thus failing to notify at least half, or one weighs the circumstantial evidence and notifies "probables". The latter will probably be required.

Conclusion.

Staphylococcal infections are a major problem at present. Acute fulminating cases are occurring more commonly than is generally realized, and it is a matter of urgency that every effort to control these infections should be made. Thus, despite the difficulties of diagnosis we must cooperate fully, and hope that the Health Department may be able to assist in those areas — maternity hospitals particularly — where serious infections are occurring. It is important that all efforts should be made to establish a diagnosis. The Health Department can always provide pathology facilities, and the hæmolytic staphylococcus is no fragile creature. It will survive long voyages and considerable temperature variation. Phage typing can also be done through the Health Department, and this will indicate whether a virulent strain of the epidemic type is the cause of infection. It is greatly to be hoped that the new Act, despite its deficiencies, will enable the Health Department to take effective action (not fumigation), and avoid some of the extraordinary statements that were made and actions that occurred in relation to an epidemic in a country hospital recently. The Press is only too anxious to make headlines of the "Golden Staph", and the medical profession cannot afford to be ignorant of its habits and its dangers.

Summary.

Twenty-two cases of staphylococcal pneumonia are reviewed briefly, five being presented as typical of different clinical syndromes.

Sixty-nine cases of pneumonia in children aged under three years are reviewed. The difficulties of diagnosing staphylococcal pneumonia are discussed, as of the 30 cases in children aged under one year, nine were proved, but at least 12 others were very probably, in fact almost certainly, staphylococcal.

Some observations are made on infections in infancy, and also on the diagnosis and treatment of staphylococcal pneumonia.

Acknowledgements.

I wish to thank Dr. Robert Vines for allowing me to include six of his patients in the 22, and for his helpful

comments on treatment and diagnosis. I also wish to thank the Superintendent of the Royal North Shore Hospital for access to the records of the past two years, and for permission to make public facts related to them.

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REDUCTION OF STAPHYLOCOCCAL INFECTION IN THE NEWLY BORN.[1]

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DURING the past three years, in common with midwifery hospitals elsewhere, the Royal Women's Hospital, Melbourne, has experienced the growing problem of staphylococcal infection in the newly born.

In 1956 there were 7045 live births in the hospital and 137 (1·9%) of the babies developed clinical staphylococcal infection. The typical lesion was a pustular skin infection or conjunctivitis. Only four examples of more severe infection were seen, two of mastitis and two of subcutaneous abscess. There were no deaths. Control measures at this period were based on "rooming-in" techniques, the abolition of centralized nursery care (except in the premature nurseries), and strict standards of hygienic nursing. In 1957 the staphylococcal infection rate increased, and 286 (3·7%) of 7614 babies born in the hospital became infected.

Largely because of this increase, the honorary medical staff set up an Infection Control Subcommittee to investigate the problem and recommend means of control. Among measures instituted were the following.

1. A staphylococcal phage-typing laboratory was set up in the hospital.

2. A survey of all sections of the hospital staff was made to ascertain the staphylococcal nasal carrier rate. In the first half of December, 1957, most of the staff, to the number of 773, were checked. Of these, 375 were nurses and 27% were found to be nasal carriers of pathogenic staphylococci. In all the other groups, including the medical staff, the carrier rate was lower, with an average of 19%. Phage typing showed that there was no predominant epidemic strain among the staphylococci recovered from the infected babies or from the staff nasal carriers. But as there was some general correspondence between the various phage patterns of the staphylococci isolated from these two groups, nurses who were carriers of *Staphylococcus pyogenes* were treated by the local application of an antibiotic cream.[1]

3. Recruits to the medical and nursing staffs were investigated before commencing duty in the hospital, and if found to be nasal carriers they were similarly treated.

4. Nursing disciplines were tightened, particularly in regard to "rooming-in" techniques.

Despite these measures, the staphylococcal infection rate in babies was 10% between January and April, 1958, and rose to 15% for the six months May to October, reaching a peak of 17% in the last month.

The Use of Hexachlorophene Emulsion.[2]

In November, 1958, the Infection Control Subcommittee started to investigate the use of hexachlorophene emulsion for the prevention of neonatal staphylococcal infection. Treatment was at first restricted to babies born in one of the hospital's two labour wards and was given only once, before transfer to the post-natal wards. This procedure reduced the number of infected babies in that unit by more than a quarter. After this favourable response, hexachlorophene emulsion was applied every 48 hours, but was still given only to the babies born in the one labour ward. In the next four weeks, 230 of 249 babies in this ward were treated and only four (1·7%) developed signs of staphylococcal infection. Of the 19 babies who were not treated, five (26%) became infected. In the same period, of 387 babies born in the second labour ward and untreated, 78 (20%) developed clinical staphylococcal infection. After this preliminary investigation the routine use of hexachlorophene emulsion was instituted for all babies, and during the next six months only 48 (1·3%) of 3744 babies born alive in the hospital developed clinical staphylococcal infections, all of minor degree.

These changes are shown in Figure I, which is a graph of the incidence of staphylococcal infection from the beginning of May, 1958, until the end of June, 1959. This chart shows the number of live births and the total number of infected babies for each month, as well as the numbers of infected babies for each of the two labour-ward units and the premature nursery. It is clear that the monthly fluctuations in the number of babies born were not a significant factor in the decreased incidence of infection.

In the past three years, therefore, the hospital incidence of staphylococcal infection in the newly born has shown both a disturbing rise and a gratifying fall. Its incidence in 1956 was 1·9%; in 1957, 3·7%; by October, 1958, 17%. The effect of the introduction of hexachlorophene emulsion was immediate and sustained. It reduced the infection rate in the first group of fully-treated babies to less than 2%, and held it to 1·3% among the 3744 babies born in the hospital in the following six months. This continued efficacy of a simple procedure is the reason for the publication of this report.

Nasal Carrier Rate in Babies.

The use of hexachlorophene emulsion also reduced the number of babies who became nasal carriers of pathogenic staphylococci while in hospital. Before the introduction of hexachlorophene emulsion, 90% of premature babies and 70% of term babies born in the hospital became nasal carriers within 10 days of birth. In the most recent check, however, only 30% of 106 premature

[1] Read at the thirty-fourth congress of the Australian and New Zealand Association for the Advancement of Science on August 27, 1959, at Perth.

[1] The antibiotic cream in use at this time was "Neotracin", applied inside the nostril twice daily for one week.

[2] Hexachlorophene emulsion is manufactured and distributed under the trade name of "pHisoHex" by Winthrop Laboratories.

babies and 38% of 111 term babies were nasal carriers of *Staph. pyogenes*.

Method of Use of Hexachlorophene Emulsion at the Royal Women's Hospital, Melbourne.

In Labour Ward.

The pædiatric nurse swabs the entire surface of the baby with 2 ml. of hexachlorophene emulsion on a cotton-wool swab, paying particular attention to the scalp, the skin creases of the neck, axillæ, groins and natal clefts. This swabbing is repeated with cotton wool moistened with warm tap-water. The lather obtained is wiped off with cotton wool and the baby dried. An additional 1 ml. of hexachlorophene emulsion is then wiped over the whole skin surface; again particular care is taken to cover the skin crease areas. This second application is allowed to dry on the baby.

If there is an excessive amount of vernix or meconium, the initial 2 ml. of hexachlorophene emulsion is increased.

In Post-Natal Wards.

The babies are treated as follows. (*a*) Normal babies: The treatment given at birth is repeated at intervals of two days until the baby leaves hospital. Whenever possible, the mother carries out the treatment under the supervision of the nursing staff. (*b*) Sick and nursery babies: The treatment is similar to that for normal babies except that it is given by the nursing staff. (*c*) Cæsarean section babies: The initial treatment is given by the nursing staff after arrival from the theatre and thereafter the procedure is as for normal babies. (*d*) Premature babies: The treatment is given at each weighing or when opportunity offers.

Attention is drawn to two procedures which affect the method of application of hexachlorophene emulsion.

1. Treatment of cords. At birth the cord is tied and the stump covered with a sterile dressing. Four to six hours later the dressing is removed, the cord is painted with a 1% solution of iodine in spirit and retied. No dressing is applied and the cord is painted daily with iodine in spirit.

2. Bathing. Apart from a demonstration bath immediately before discharge, no baby is bathed in the hospital. Cleansing, when required, is carried out by sponging with tap-water.

No contraindication to the use of hexachlorophene emulsion was found. Six babies developed a generalized erythema soon after its application, but in each the rash disappeared rapidly when treatment was stopped.

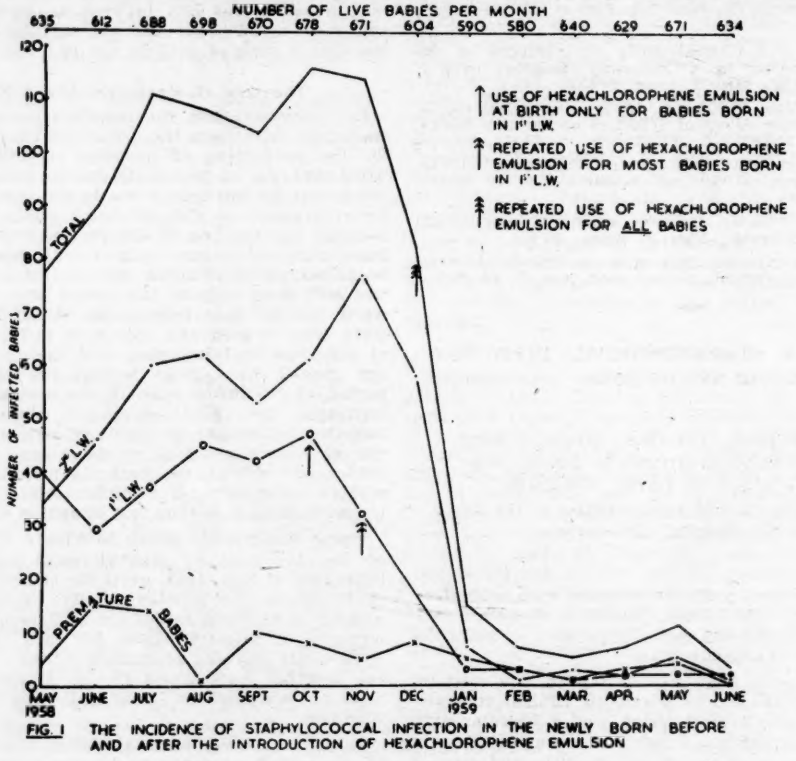

FIGURE I.

The incidence of staphylococcal infection in the newly born before and after the introduction of hexachlorophene emulsion.

Summary.

1. At the Royal Women's Hospital, Melbourne, the use of hexachlorophene emulsion immediately and effectively reduced the rising incidence of staphylococcal infection in the newly born. In the six months before its use the incidence of these infections was 15%; in the first six months of its full employment it was only 1·3%.

2. During this trial there was also a fall in the percentage of babies who became nasal carriers of pathogenic staphylococci. For premature babies the carrier rate dropped from 90% to 30%, and for term babies from 70% to 38%.

Acknowledgement.

The full cooperation of the honorary medical staff of the Royal Women's Hospital in this work is gratefully acknowledged.

POST-PARTUM PANHYPOPITUITARISM.

By B. J. PASCOE AND A. E. McGUINNESS,
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THE concept of panhypopituitarism has altered very considerably since the original description by Simmonds in 1914. This change in concept is largely the result of Sheehan's classical study of the syndrome, published in 1939. In this study he defined more completely its ætiology and clinical manifestations.

This paper is concerned with that group, as defined by Sheehan, in which the cause of the pituitary necrosis is "collapse at delivery", usually after hæmorrhage. Other causes of pituitary necrosis, such as trauma, tumour, syphilitic endarteritis, steatorrhœa and various granulomata are not discussed.

The primary aim in the presentation of the following cases is to reemphasize the natural history of this syndrome, and to suggest that early diagnosis depends almost entirely on the presence of a high index of suspicion. A further purpose is to discuss coma, a complication of panhypopituitarism, and to review its management.

The greatest individual contribution to the understanding of the ætiology, pathology and clinical manifestations of this condition was made by Sheehan (1937 to 1954). He pointed out that the most common cause of panhypopituitarism was necrosis of the gland after "collapse at delivery" usually after hæmorrhage; further, that necrosis of the anterior pituitary lobe was a relatively common finding in women who died during the puerperium. He noted that the extent of the necrosis at autopsy and the severity of subsequent clinical manifestations in those surviving were proportional to the degree of collapse at delivery. Spontaneous improvement in the subsequent course was rare, but marked improvement or complete cure could follow a further pregnancy. In a follow-up study of patients with a history of collapse at delivery, Sheehan found a high incidence of symptoms of panhypopituitarism. He observed that the severity of symptoms correlated in a general way with the extent of the infarction, and suggested also that variability of symptomatology could depend on the type of pituitary cells involved. He pointed out that the "pituitary cachexia" described by Simmonds (1914) and stressed by subsequent writers and textbooks was, in fact, a very rare entity, and that many similar reported cases were probably examples of anorexia nervosa. He demonstrated again that the diagnosis of panhypopituitarism in many instances was not made because of a failure of appreciation of its common clinical manifestations.

Without detracting from the outstanding work of Sheehan, it should be noted that Lichtwitz in 1922 also pointed out that cachexia was not an essential component of the syndrome, though the importance of his observation was not appreciated at the time.

MATERIALS AND METHODS.

The following cases, which were seen at Sydney Hospital during the past four years, have been divided, for the purpose of discussion, into two groups: (i) cases in which the syndrome remained unrecognized for some years; (ii) those diagnosed early in the course of the disease. Two cases are presented under the second heading; they were diagnosed respectively two months and eight days *post partum*. The presence of pituitary necrosis in the second case was confirmed at autopsy.

Group I.

The six cases presented in this group illustrate, with minor variations, the characteristic clinical pattern emphasized by Sheehan, namely, the history of collapse at delivery, followed by absence of lactation and of subsequent menstruation; a gradual loss of pubic and axillary hair, pallor and dryness of the skin; loss of energy, apathy and mental slowing; disinclination to carry out minor household duties and abnormal sensitivity to cold. Body weight is usually normal; occasionally marked anorexia and weight loss may occur. The final appearance may be typically myxœdematous, or may be that of premature senility. These subjects as a group are loath to seek medical advice, and if they do so, it is not uncommon for a diagnosis such as anæmia or myxœdema to be made, with subsequent poor response to therapy. Some patients are admitted to hospital in coma.

Laboratory investigations reveal low basal metabolic rates and low urinary steroid levels. There may be anæmia, achlorhydria, low blood sugar levels and a flat glucose tolerance curve. The Kepler water test and the ACTH stimulation test may be employed to determine adrenal function, and are discussed later.

As our cases possessed many features in common, it was decided to present them in table form, both for convenience and to illustrate more clearly the characteristic clinical picture. Tables I and II show the clinical features and results of laboratory investigations in this group.

Comment.

Several points in this series are worthy of comment.

1. The history of recurrent pyelonephritis in three of the six cases may be significant. It is an unusual incidence and may be a factor in management.

2. The temporary return of menstruation in patient D after 12 months' initial amenorrhœa is an uncommon finding, but has been described previously (Sheehan and Murdoch, 1938). Its explanation is obscure.

3. Mild hypertension was noted in three cases. This did not appear to be related to renal disease; the only patient (I) shown to have impaired renal function had a normal blood pressure. One patient (E) had marked aggravation of hypertension after the institution of cortisone therapy. Reduction of dosage to restore previous blood pressure levels resulted in inadequate hormonal control, and eventually hormonal control was established at the expense of a slight elevation of blood pressure, her final diagnosis being panhypopituitarism and essential hypertension.

4. A remarkable pigmentation of the hands, arms and face occurred in one patient (I) (Figures II and III). The absence of pigmentation, even in response to sunburn, is considered a prominent feature of panhypopituitarism, presumably due to failure of melanophore stimulating hormone. It is conceivable that the cells producing this hormone have been spared in this case.

5. Two patients were treated previously for anæmia and one for hypothyroidism, with poor response to therapy in all three cases.

6. Two patients in our series (E and D) experienced episodes of coma, and their clinical records are now described in more detail.

Coma.

Patient D was comatose on four occasions. The precipitating factors were not clear in any of these attacks, though three followed temporary cessation of therapy.

On her first admission to this hospital during the third of these attacks, a history was obtained of low back pain, vomiting and diarrhœa for 24 hours. She had not taken thyroid and cortisone as prescribed for her for some considerable time. On admission to hospital her temperature was 99° F. The blood pressure readings were 90/60 mm. of mercury, the pulse rate was 108 per minute. A cough was present, and numerous coarse rhonchi were present in both lungs; there was no sputum. A microscopic examination of urine disclosed only 0 to 4 pus cells per high power field. The blood sugar level was 55 mg. per 100 ml. A respiratory infection and the absence of maintenance therapy were thought to be the cause of the collapse. Glucose-saline infusions were given parenterally, together with hydrocortisone and antibiotics intravenously.

She remained pyrexial over the following four days, and her recovery during this period was gradual. By the third day in hospital confusion was less marked, her tempera-

TABLE I.
Clinical Details of the Six Patients in Group I.

Clinical Features.	Patient.					
	E.	M.	D.	K.	P.	I.
Age (years) ..	54	68	52	42	35	48
Relevant facts of last parturition[1]	Massive post-partum hæmorrhage at birth of last child.	Severe post-partum hæmorrhage at birth of last child; no transfusion.	Stormy puerperium, no labour details at birth of last child.	Severe post-partum hæmorrhage at birth of last child; in hospital three months.	No details from birth of last child.	Manual removal of placenta, but no other details of birth of last child.
Duration of symptoms (years).	19	14	27	17	7	14
Lactation ..	Absent.	Absent.	Absent.	Absent.	Not recorded.	Absent.
Menstruation ..	Absent.	Absent.	Absent 12 months, then scanty for six years, then ceased.	Absent.	Absent.	Absent.
Weakness, apathy, lethargy, etc.	+	+	+	+	+	+
Sensitivity to cold	+	Not recorded.	+	+	Not recorded.	+
Mental changes ..	Slowing, episodes of confusion and paranoia.	Slowing.	Slowing, episodes of confusion, and paranoid hallucinations.	Slowing.	Slowing, poor memory.	Slowing, slow monotonous speech.
Episodes of coma	Several.	–	Four.	–	–	–
Pallor	+	+	+	Very slight.	+	–
Facies	Myxœdematous.	Myxœdematous.	Expressionless, thin, wrinkled.	Normal.	Not recorded.	Expressionless, somewhat myxœdematous.
Skin	Dry, coarse, thin, no sweating.	Dry, coarse.	Dry, thin, smooth, no sweating.	Normal.	Dry, smooth, and pale.	Dark pigmentation of arms and legs, dry skin.
Body hair ..	Absent.	Absent.	Absent.	No axillary hair, pubic hair very sparse.	No axillary hair, scant pubic hair.	Absent.
Weight-height relationship.	Slightly obese.	Normal.	Thin.	Slightly obese.	Normal.	Normal.
Pulse (per minute)	64	80	70	66	60	80
Blood pressure (mm. of mercury)	180/100	170/100	120/70	145/95	90/60	125/85
Urine	Heavy cloud of albumin.	Negative.	Negative.	Negative.	Negative.	Albumin ++.
Previous history..	Chronic pyelonephritis.	Recurrent pyelonephritis; treated for anæmia.	Treated for anæmia.	Treated with thyroid tablets.	—	Recurrent pyelonephritis.

[1] In each case the symptoms dated from the birth of the last child.

ture was 99° F., and blood pressure readings were 125/80 mm. of mercury. Occasional vomiting continued. The only electrolyte abnormality was a serum sodium content of 125 mEq/l. The infusion was stopped, and fluids taken orally and hydrocortisone given intramuscularly were continued.

On the fourth and fifth days her somewhat vague, detached and slightly confused mental state showed improvement. Thyroid, half a grain, and cortisone, 50 mg. daily, were necessary for maintenance therapy.

Two weeks later it was decided to suspend thyroid and cortisone preparatory to a diagnostic ACTH stimulation test. After cessation of drugs for 10 days, she was given ACTH intramuscularly for three days, and on the fourth day an ACTH infusion was commenced. After the commencement of this infusion, her fourth attack of coma took place. The blood sugar level at this time was 50 mg. per 100 ml. Serum sodium and potassium levels both showed an appreciable fall (Table III).

The blood pressure readings were 110/60 mm. of mercury, and the temperature was 97·4° F. She passed large volumes of urine—a total of 3·2 litres in the 24 hours subsequent to the onset of coma.

Again an infusion of glucose-saline and hydrocortisone was given, and the blood sugar level four hours later was 400 mg. per 100 ml. Despite this rapid and complete correction of hypoglycæmia, the response of the patient was much more gradual. Twenty-four hours later she was considerably improved, the serum sodium level being 121 mEq/l. and the blood sugar level 168 mg. per 100 ml.

It was appreciated that in the previous attack of coma the blood sugar level had risen to 100 mg. per 100 ml. some days before full recovery had occurred. This delay in clinical response after correction of the blood sugar levels has been observed by others (Sheehan and Summers, 1954), and suggests that the blood sugar level is not the most important factor in the mechanism of these attacks, the nature of which still remains obscure. The relationship between the ACTH infusion and the onset of coma is referred to below.

In the case of patient E, a rather vague history of several such attacks was obtained. One definite attack occurred while she was under supervision and followed a "cold", during which she stopped taking her tablets.

It can thus be seen that, whatever other factors are involved, both infection and omission of therapy may be associated with the onset of this complication.

ACTH Test.

Of the laboratory investigations, the ACTH stimulation test merits elaboration. This test, correctly applied, may distinguish the primary hypoadrenalism of Addison's disease from the secondary form occurring in panhypopituitarism.

Patients with panhypopituitarism may show little or no response on the first or second day of ACTH infusion, but respond significantly by the third day (Engbring *et alii*, 1956). They may therefore be distinguished from

TABLE II.

Laboratory Investigations of the Patients in Group I.

Patient.	Hæmoglobin Value. (Grammes per 100 ml.)	White Cell Count per (C.mm.)	Erythrocyte Sedimentation Rate. (Mm. in 1 Hour.)	X-Ray Examination of the Chest.	Electrocardiogram.	Serum Cholesterol Level. (Mg. per 100 ml.)	Basal Metabolic Rate. (Percentage.)	Urinary Steroids Excreted. (Mg. in 24 Hours.)		Other Investigations.
								17-Ketosteroids.	17-Hydroxycorticosteroids.	
E	13·8	9500	62	No abnormalities detected.	Sinus bradycardia.	—	−7	1·5	—	In the electrocardiogram, persistent generalized slow activity consistent with metabolic disturbance.
M	8·1	5600	38	No abnormalities detected.	No abnormalities detected.	286	−32	3·0	—	Urea concentration, 3·3 grammes per 100 ml.; urea clearance, 64%.
D	12·0	6100	12	Fibrotic lesion in the right apex.	Low voltage, increased *Q-T* interval.	135	−18	0·3	0·2	Blood urea nitrogen level, 15 mg. per 100 ml.; liver function tests, normal results; sputum (repeated) culture for acid-fast bacilli, negative.
K	15·5	5900	11	No abnormalities dedetected.	Normal.	265	−75	2·0	3·1	I^{131} 24-hour uptake, 45%; barium meal X-ray examination, no abnormalities.
P	10·4	3400	—	—	—	222	−19	—	—	——
I	13·8	5300	—	No abnormalities detected.	First degree auriculoventricular block; myocardial defect.	320	−22	1·9	—	Urea clearance, 40%; urea concentration, 2·29 grammes per 100 ml. Microscopic examination of the urine showed numerous pus cells, granular casts, organisms.

Note: In all cases Mantoux (1/100 and 1/1000), Wassermann reaction and Kahn tests gave negative results, and skiagrams of the skull showed no abnormalities.

non-endocrine cases (which respond on the first day) and from cases of primary adrenal insufficiency (which show no response on any day of ACTH stimulation).

The test was employed in three of the six cases, different procedures being adopted in each case in accordance with the data available at the time.

In the case of patient D, priming doses of ACTH were given intramuscularly for three days prior to the infusion. However, shortly after the commencement of the infusion, the patient suffered collapse similar in every respect to the comatose state in which she was admitted to hospital. The infusion was immediately discontinued and hydrocortisone commenced. It is of interest that similar occurrences, though rare, have been reported during ACTH infusions in Addison's disease (Jenkins *et alii*, 1955; Martin *et alii*, 1957). Their mechanism is uncertain. ACTH was given intramuscularly to A for three days without subsequent infusion. Neither patient showed any adrenal response, but the inadequacy of the tests employed in these cases precludes any valid conclusion.

K, a more recent patient, was given the three-day infusion method, with the determination of urinary steroid and electrolyte contents as described by Stacy (1958). The rise in the level of urinary 17-hydroxycorticosteroids offers the most sensitive index of adrenal response (Jenkins *et alii*, 1955; Engbring *et alii*, 1956; Martin *et alii*, 1957; Stacy, 1958). In this case (Table IV) the response, though not reaching normal figures, was prompt and quite definite.

The Kepler water test was carried out in several cases, but the results were of little contributory value. As the test is not without danger, it is considered unnecessary as a diagnostic procedure.

The insulin sensitivity test has been abandoned for similar reasons.

Group II.

The following are the clinical records of two patients who were diagnosed as cases of panhypopituitarism two months and eight days respectively *post partum*.

The patient, C, was aged 26 years. Two months before her admission to this hospital she had given birth to her first child. The delivery was a difficult one, complicated by toxæmia, dystocia, forceps delivery, retained placenta, severe post-partum hæmorrhage and profound shock, requiring transfusion of three litres of blood. After recovery she suffered puerperal infection with pyrexia and offensive lochia.

On returning home she was listless, weak and apathetic. She developed an inflammation of the left breast, which was controlled by penicillin. A blood count disclosed an anæmia (hæmoglobin value of 9·5 grammes per 100 ml.), and a further transfusion of 800 c.cm. of blood was given.

During the night after her transfusion she suffered a collapse, with an imperceptible pulse, an apex rate of 120 beats per minute and a blood pressure reading of 36 mm. of mercury systolic.

Glucose-saline was given intravenously and "Methedrine" and "Eschatin" were given parenterally. The following night she was much improved. During the next two months she was lethargic, weak and apathetic, with persistent retching and vomiting. Lactation had not occurred.

At our examination she was pale, listless and drowsy, with poor cerebration and delayed response to questioning. Her voice was drawling and monotonous. Her skin was pale, dry, smooth and of fine texture. Axillary hair was present, but there was no return of pubic hair.

The pulse rate was 80 per minute, and the blood pressure readings were 95/75 mm. of mercury. She was apyrexial. Physical examination was otherwise unrevealing. Vaginal examination revealed a slight dilatation of the external os with slight muco-purulent discharge. The uterus was slightly larger than normal.

Laboratory investigations produced the following information. The hæmoglobin value was 12 grammes per 100 ml., the white cell count, 4200 per cubic millimetre, and the erythrocyte sedimentation rate, 45 mm. in one hour. Skiagrams of the chest, skull and abdomen showed no abnormalities. Attempts at culture of a cervical swab produced no growth. The blood urea nitrogen level was 9 mg. per 100 ml., the blood creatinine level 1 mg. per 100 ml. and the serum cholesterol level 200 mg. per 100 ml. The serum electrolyte content was normal, and the basal metabolic rate was −32%. The Wassermann reaction and Kahn tests gave negative results, and 1·5 mg. of urinary 17-ketosteroids were excreted in 24 hours. A glucose tolerance test gave the following blood sugar levels (milligrammes per 100 ml.): fasting, 78; half an hour after ingestion of glucose, 85; at one hour, 82; at one and a half hours, 75; at two hours, 86.

An ACTH infusion test was carried out for two days, when it was discontinued at the patient's request. The urinary steroid level showed no rise during this period. Unfortunately, the infusion could not be continued for three days, and as a result the test was of limited value. A diagnosis of post-partum panhypopituitarism was made and therapy instituted with cortisone, 12·5 mg. three times

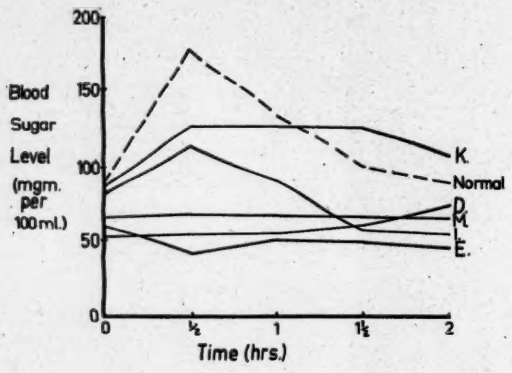

FIGURE I.

The characteristically flat glucose tolerance curves in cases in Group I.

a day, and thyroid, half a grain daily. There was marked improvement in her mental state and general well-being.

Six months later she was bright and active. Her skin was still thin and delicate. There was no return of menstruation or of pubic hair.

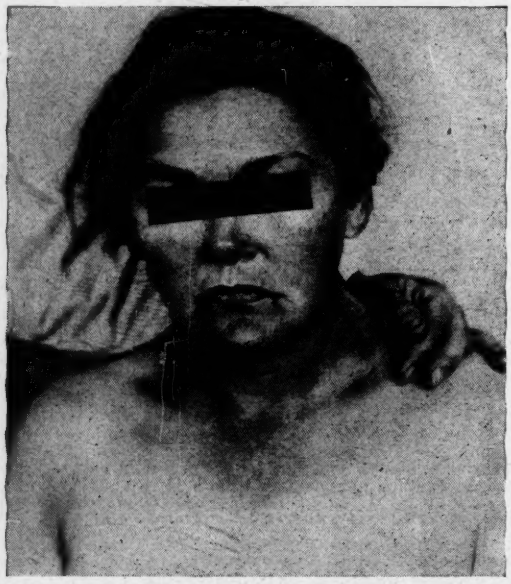

FIGURE II.

Patient I, showing pigmentation of the face.

The second patient, N, aged 34 years had been quite healthy apart from the occurrence of hypertension and ankle œdema during two previous pregnancies. During the thirty-sixth week of her third pregnancy, her blood pressure was 130/90 mm. of mercury, and her urine contained no abnormal constituents.

On May 19, 1958 (thirty-eight and a half weeks pregnant) she experienced severe abdominal pain, and on the following day she suffered two convulsions and became very drowsy. She was admitted to another hospital, where her blood pressure reading was 180/110 mm. of mercury, and a severe degree of albuminuria was noted. The membranes were artificially ruptured, and a still-born fœtus was delivered, with subsequent severe hæmorrhage and shock, and with unrecordable pulse and blood pressure. The total blood loss was estimated at four to five pints, and it was not until seven hours later that shock was finally relieved.

Over the following eight days she was oliguric. On May 28 her blood urea level was 234 mg. per 100 ml. and the serum potassium level 8·6 mEq/l. She was given 40 grammes of glucose and 20 units of insulin, and was then transferred to Sydney Hospital.

On arrival she was drowsy, and one and a half hours later had lapsed into deep coma. A diagnosis of hypoglycæmia was made, and 50 grammes of glucose given

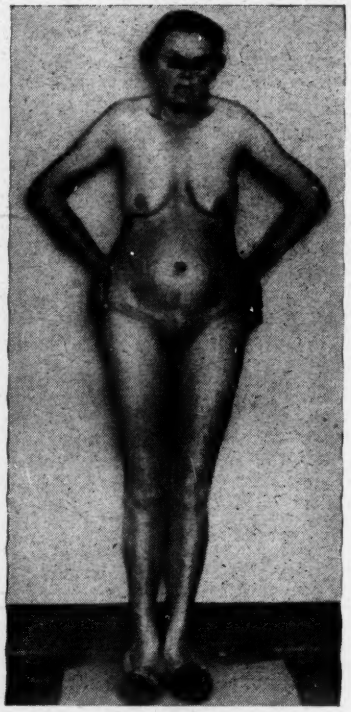

FIGURE III.

Patient I, showing pigmentation of the face, arms and legs, together with absence of pubic hair.

intravenously resulted in a return to consciousness. Her *blood sugar level the following morning, while conscious,* was 45 mg. per 100 ml.

The possibility of pituitary necrosis with resulting insulin sensitivity as a cause for the hypoglycæmia was considered, and no further insulin was given. A hydrocortisone infusion was commenced, and considerable improvement in her general condition resulted.

"Resonium A" was given in an attempt to control her *hyperkalæmia, but on the night of May 29 she* died unexpectedly.

The relevant autopsy findings were as follows. Her weight was 120 lb.; her height five *feet one inch. Macroscopic* examination revealed pallor of both renal cortices. The uterus was slightly enlarged with a laceration of the cervix. The pituitary gland appeared *normal.*

Microscopic examination produced the folowing findings. *In the kidneys some of the tubules* contained hæmoglobin and red cell casts. There was evidence of degeneration and of reparative change in the tubular epithelium *(Figure IV).*[1] *The breast showed hyperplasia as seen in*

[1] For Figures IV, V and VI see art-paper supplement.

late pregnancy, but no evidence of lactation. In the pituitary gland the anterior pituitary lobe showed almost complete necrosis, the only cells spared being a few scattered marginal cells lying beneath the capsule (Figures V and VI). The posterior pituitary lobe was unaffected.

Comment.

These two cases are examples of early diagnosis made on clinical grounds and based purely on an awareness of the possibility of pituitary necrosis after collapse at delivery, whether due to hæmorrhage or to "obstetric shock".

TABLE III.
Serum Electrolytes (mEq/l.).

Electrolyte.	Average Values under Stable Conditions without Complications.					During Episode of Coma.	
	E.	M.	D.	K.	I.	E.	D.
Na ..	136	143	128	138	136	128	104
K ..	4·6	4·4	3·7	4·1	4·0	4·0	3·6
Cl ..	102	100	95	102	99	95	77
HCO_3 ..	28	—	22	18·2	—	28	22·5

It would appear that where this possibility exists, and the condition of the patient concerned is unresponsive to standard resuscitation procedures, the use of a hydrocortisone infusion may be a life-saving measure, and should be instituted without delay.

In the case of N, the renal failure with hyperkalæmia was thought to have been the major factor contributing to death.

TABLE IV.
ACTH Stimulation Test (Patient D).

Day.	Urinary Steroids Excreted. (Mg. in 24 Hours.)		17-Hydroxycorticosteroids Increment. (Mg. in 24 Hours.)	
	17-Keto-steroids.	17-Hydroxy-corticosteroids.	Patient K.	Normal.[1]
1 (basal) ..	2·6	2·8	—	—
2 (basal) ..	2·0	3·1	—	—
3 (ACTH, 40 units)	—	14·3	11	20
4 (ACTH, 40 units)	6·5	11·5	8	35
5 (ACTH, 40 units)	5·4	30·2	27	50

[1] The normal 17-hydroxycorticosteroids increment represents the average rise in six cases responding to ACTH (Stacy, 1958).

DISCUSSION.

A review of our small series shows that the diagnosis of post-partum panhypopituitarism depends upon familiarity with its common manifestations and on awareness of its possible occurrence, in varying degrees of severity, as a sequel to obstetric collapse.

The ever-present hazard of coma in these cases can result from infection and/or cessation of therapy. Its actual mechanism remains obscure, but it may be associated with hypoglycæmia, hyponatræmia and hypothermia (Sheehan and Summers, 1952).

Hypoglycæmia alone may cause coma. However, in one of our cases rapid and complete correction of hypoglycæmia on two occasions made no appreciable difference in the patient's clinical state. Similar experiences have been reported with various forms of therapy by Sheehan and Summers (1952), and in view of the fact that spontaneous recovery from coma not infrequently occurs (Sheehan and Summers, 1952) one is left with the impression that many of these episodes run a course which is independent of therapy. Several writers (Sheehan and Summers, 1952; Summers, 1953; Malden, 1955) have drawn attention to the close similarity of myxœdema coma to hypopituitary coma, and it may well be that secondary hypothyroidism is the cause of the coma in panhypopituitarism. This, of course, does not assist materially, as myxœdema coma is equally obscure in its pathogenesis.

Hyponatræmia, which is also a common finding in hypopituitary coma, occurred in both our cases (Table III), and suggests secondary adrenal insufficiency. In the adrenal crisis of Addison's disease, an excessive amount of sodium is lost, resulting in hypotonicity of the extracellular fluids and consequent shift of water into the cells. Water retention as a cause of death in hypopituitarism was described by Whittaker and Whitehead (1954). Salmon (1956) described a case in which an episode of coma was precipitated by the Kepler test, recovery following diuresis. Hypoglycæmia was also present in this attack, but correction of the blood sugar level produced no response, in marked contrast to a previous similar attack in the same patient, where correction of hypoglycæmia resulted in immediate recovery. The experience of this writer emphasizes the complex nature of coma in this condition. Salmon noted hyponatræmia on two occasions in his case. It is possible that hypotonicity of the extracellular fluids and intracellular shift of water are important factors in the production of hypopituitary coma, which not uncommonly commences with convulsions (Sheehan and Summers, 1952). Recovery in our cases certainly appeared to parallel the restoration of the levels of serum sodium and chloride to their former levels.

It should be noted, however, that the marked electrolyte disturbances seen in Addison's disease are not generally a feature of panhypopituitarism, and that the foregoing observations are difficult to reconcile with the supposed independence of aldosterone secretion. The disturbance of the serum electrolyte pattern may then be merely a superficial reflection of a much more fundamental hormonal and metabolic imbalance.

Until coma is more clearly understood, it seems reasonable that therapy be directed towards correction of the more apparent abnormalities of hypoglycæmia, hyponatræmia and hypothermia.

SUMMARY.

Eight cases of panhypopituitarism are presented.

Six of these were unrecognized for many years before final diagnosis. Two were diagnosed within a short time of their onset.

All were diagnosed essentially on clinical grounds. One was confirmed at autopsy. The necessity for awareness of the existence of the syndrome as a means to early diagnosis is stressed.

Certain noteworthy features arising from presentation of the cases, and in particular the complication of coma, are discussed.

ACKNOWLEDGEMENTS.

We are grateful to Dr. A. H. Tebbutt for his autopsy report, and to Mr. Rex Money, of the Department of Photography, Sydney Hospital, for his assistance.

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HERPES SIMPLEX INFECTION IN THE NEW-BORN.

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IN 1955 Williams and Jack reported the first case of recorded death in Australia due to generalized herpes simplex infection. They stressed the importance of preventing persons with herpes simplex infection from handling new-born babies. As three additional deaths due to this virus have been studied in our laboratory since this report, it is thought that attention should be drawn to the sources of infection in these babies.

In one case infection was the result of contact with a temporary nursing attendant suffering from herpes labialis. In another, whilst no definite contact was evident, serological studies showed that the mother had never been infected with the virus, thus implicating a third person as the source of the infection.

The third infant was born of a mother who had suffered from recurrent attacks of herpes labialis, the last attack three days before delivery.

In older children there is a danger of cross-infection with herpes simplex of patients with severe skin ulceration. A patient with severe eczema was nursed in a ward in which another patient with Kaposi's eruption (eczema herpeticum) was resident. Infection occurred almost certainly as a result of mere proximity, but a shared ointment pot could have been equally culpable.

Cross-infection with the virus of herpes simplex may arise from direct contact with infected staff members or from other patients. The former risk suggests that all members should be relieved of duty when suffering from the periodic recurrences of mild herpetic infections, especially if they are attached to a premature infants' nursery. The latter emphasizes a point made by many authors—viz., that herpes infections of any form should not be managed in a dermatology ward.

Once past the neonatal period and the later age in which infantile eczema occurs, the danger of severe infection with herpes simplex lessens. At this stage most children develop mild infections which lead to immunity from further severe infections.

Summary.

We have stressed the danger of herpes simplex virus infection in the neonatal period, and the danger of secondary infection of eczema with herpes simplex virus.

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Reports of Cases.

ANOTHER AUSTRALIAN CASE OF HISTOPLASMOSIS.

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AND

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HISTOPLASMOSIS was once regarded as a rare and invariably fatal disease; but, since Christie and Peterson (1945) and Palmer (1945) published the results of the first large-scale histoplasmin surveys in the United States of America, it has been realized that benign and asymptomatic forms are widely prevalent. Three cases have been reported from Australia (Johnson and Derrick, 1948; Inglis and Powell, 1953; and Dowe *et alii*, 1953), and of these only the second was fatal. A fourth case, which is of special interest on account of its apparently localized, benign nature, is described in the present paper.

Clinical Record.

The patient, a man, aged 51 years, had spent all his life in Queensland, both in stock work and, for the past 22 years, with the State railways as a fettler, and more recently as a boiler wash-out man in Rockhampton. He had worked at Emerald, Springsure and Emu Park. He had had no previous illness, and in fact had not felt ill at any time since the appearance of the lesion. He was edentulous and had been for 20 years. He visited his doctor on September 12, 1957, because of swelling of the mucosa of his lower jaw which prevented him from wearing his dentures. It had started three or four months previously, and a small ulcer had been present, which had since healed.

On examination, he was found to have a lumpy swelling of the mucosa overlying his mandible on the right side, between the positions of the central incisor and first molar. It extended laterally a short way into the sulcus between the cheek and the jaw. No glands were palpable in the neck. A provisional diagnosis of epithelioma was made, and a specimen was removed for microscopic examination of sections. The response of the blood to the Kline test was negative, and the findings from a full blood count and an X-ray examination of the chest were normal. Examination of sections of the two fragments of tissue obtained showed thickening of the mucosa, with a lesion in the submucosa infiltrated by giant cells, round cells and histiocytes. Groups of hæmatoxylin-staining bodies were scattered through the submucosa. They were just visible with the low power of the microscope, but with the high power many of them were seen to be oval in shape and to have a pale halo (Figure I)[1]. They stained well with periodic acid-Schiff stain, and were identified provisionally as *Histoplasma capsulatum*. The histoplasmin skin test performed with a 1:100 dilution of an antigen from Eli Lilly and Company, gave a strongly positive reaction (20 mm. in diameter). Liver function tests showed no abnormality, apart from the cephalin cholesterol flocculation test, the result of which was strongly positive. When the patient was last observed, in February, 1958, the lesion was smaller in size and much paler in colour, the appearances suggesting that healing was taking place.

[1] For Figures I and II see art-paper supplement.

The patient remains in excellent health, is able to wear his dentures and has gained a stone in weight.

Mycological Investigation.

Tubes of Littman's liver-spleen-glucose-blood agar medium (Littman, 1955), Sabouraud's agar, and Sabouraud's agar *plus penicillin, streptomycin and actidione*, were inoculated with scrapings from the lesion, kept at room temperature for 14 days and then returned to Brisbane. At that stage, there were minute, irregular, greyish colonies on the Littman's medium. When these were mounted in lactophenol-cotton blue, branching septate hyphæ and large smooth-walled spores were observed. There was no growth on the Sabouraud's agar up to three months.

Corn-meal agar slide cultures were prepared from the tiny colonies, and incubated at 27° C. Four days later, branching septate hyphæ, small smooth-walled, round to pyriform conidia, and typical large tuberculate chlamydospores (9 to 16 μ in diameter) were observed (Figure II). The primary colonies were also subcultured onto Sabouraud's agar and incubated at 27° C., and also onto blood agar and Francis' glucose-cystine blood agar and incubated at 37° C. White, fluffy colonies, which gradually became buff-coloured, developed on Sabouraud's agar (Figure III). Small moist, off-white colonies, which on microscopic examination were found to consist of small oval, budding cells, developed on Francis' agar.

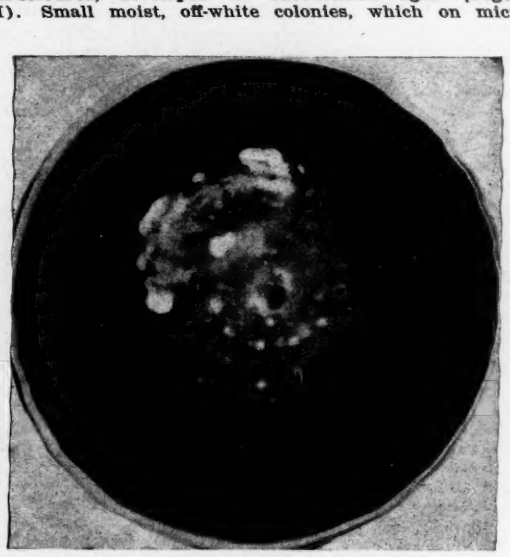

FIGURE III.

H. capsulatum on Sabouraud's agar, after 28 days at room temperature.

The cultural characteristics confirmed the identification of the organism as *Histoplasma capsulatum* Darling.

Source of Infection.

H. capsulatum has been recovered from soil in North America, Venezuela and Peru (Ajello, 1956), in South Africa (Murray *et alii*, 1957) and in India (Kalra, 1957, as *H. duboisii*). The most favourable areas appear to be those frequented by chickens, other birds, or bats. Ajello (1956) reported that in one county in Tennessee, 39% of soil samples collected in chicken yards and houses yielded *H. capsulatum*, compared with 13% of samples from other habitats.

An attempt was made to locate the source of the Rockhampton patient's infection. He kept fowls, and the floor of his fowl house was covered with sawdust, which he cleaned out and replaced once a month. Twelve months earlier he had cleaned out a very dusty sawdust container. Five samples of soil and sawdust from his garden and fowl house, and two from the mill that supplied the sawdust, were collected by the local health inspector and sent to Brisbane. They were inoculated into mice by the method described by Harsh *et alii* (1956), but *Histoplasma* was not isolated.

Histoplasmin Skin-Testing.

In August, 1953, a histoplasmin skin-testing survey was undertaken in the Rockhampton district, where another suspected case was under investigation. Intradermal tests were performed on 768 people (317 males, 201 females, 250 children) with a 1:100 dilution of an antigen supplied by the Communicable Disease Center, Public Health Service, Atlanta, Georgia, U.S.A. The subjects tested were 523 aborigines (125 males, 148 females, 250 children) from a settlement 104 miles west of Rockhampton, 55 adult patients (18 males, 37 females) from a tuberculosis sanatorium, 120 workers (105 males, 15 females) at a Rockhampton meatworks, and 70 workers (69 males, 1 female) at the Rockhampton Post Office. A reaction was regarded as probably positive if there was a 5 mm. or greater area of redness and induration 72 hours after inoculation. Six slight reactions (6 mm., not very red, with a small lump) were observed. Three were from the aboriginal settlement, and one each from the sanatorium, meatworks and Post Office. It is difficult to assess their significance in the absence of any unequivocally strong reactions during the survey.

Summary.

An apparently transitory infection of the jaw of a Rockhampton man with *H. capsulatum* was diagnosed histologically, and confirmed by culture. The organisms were not revovered from samples of soil and sawdust from his garden and fowl yard. A histoplasmin survey of the district gave six weakly positive reactions in 768 persons tested.

Acknowledgements.

Our thanks are due to Dr. J. I. Tonge, Laboratory of Microbiology and Pathology, Brisbane, for confirming the histopathological diagnosis and for his interest and advice, to Dr. E. W. Abrahams, Chest Clinic, Department of Health and Home Affairs, for supplying the histoplasmin, to Dr. I. M. Mackerras, Queensland Institute of Medical Research, for his help and advice, and to Dr. M. Gold and Dr. J. Ross of Rockhampton, who referred the patient to us. The thanks of one of us (T.A.N.) are also due to the Commonwealth Director-General of Health for permission to publish this report.

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GRANULOMA FACIALE: REPORT OF A CASE.

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Clinical Record.

IN July, 1958, Mr. B. complained of a non-enlarging spot in the centre of his forehead, of twelve months' duration. He stated that he also had a pimple on the nose which had appeared five months previously and was gradually enlarging, despite the application of various ointments; it was not painful or itchy, and was thought to be some infection. Although he had suffered from hives due to penicillin, he had had no insect bites or other infection. He felt well. There was no significant family history.

On examination of the patient, there were four facial lesions, as follows (Figure I). (i) There was a slightly elevated, domed, circinate plaque of dull yellowish-brown colour, 0·9 cm. in diameter, of firm consistency, fixed in

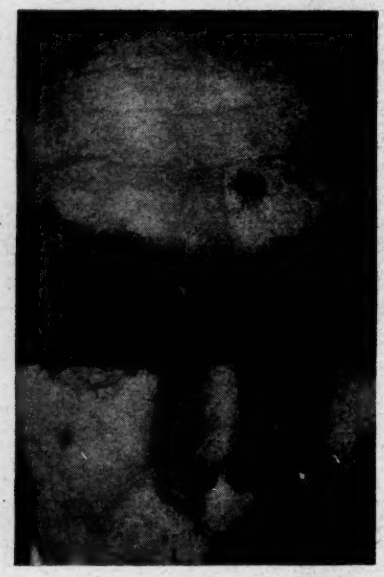

FIGURE I.
Distribution of lesions on the face.

the skin just above the tip of the nose. A very fine peripheral ring of erythema was present. (ii) There was a dull purplish-red macule, appearing superficially stippled, on the lower part of his forehead, just above the medial border of the left eyebrow. (iii) There were two small dull purplish-red macules on the left cheek, the lateral lesion being the larger. No other significant or relevant findings were obtained on physical examination. A histopathological examination was made of the lesion on the nose in July, 1958, and the report was as follows. Other than a moderately dilated keratin-plugged follicle, and for the most part a slightly acanthotic epidermis, the epidermis was normal. On the sides of the lesion there was a clear subepidermal zone, but in the rest there were places where the infiltrate impinged against the epidermis. The lesion (Figure II)[1] occupied the upper half of the corium, with a deep extension in one place. The lesion showed several phases. In places there were dilated vessels whose endothelial walls appeared almost normal, but they were immediately clothed by a thick, dense infiltrate of neutrophils, many showing nuclear fragmentation, eosinophils, lymphocytes and histiocytes (Figure III). These foci tended to coalesce. Elsewhere many of the affected vessels were being obliterated and replaced by young fibrocellular tissue. A large part of the lesion undergoing fibrosis was extensively permeated with the foregoing type of cellular infiltrate, with fibroblasts and plasma cells in addition. In the deep extension previously mentioned there were dense collections of plasma cells mixed with lymphocytes, eosinophils and neutrophils, in which were embedded one or more vessels affected as first described above. On special staining, copious blood pigment was found. The histological findings were those described in granuloma faciale (also called eosinophilic granuloma or granuloma with eosinophilia). The lesion was benign.

[1] For Figures II and III, see art-paper supplement.

Discussion.

This condition, which appears usually in middle or later life, is uncommon. Lesions may be single or multiple, and occur most often on the face. Those which enlarge do so only very slowly, so that they may become palpable and of firm consistency. The colour is red or red-brown. They are symptomless and do not ulcerate.

The exact pathogenesis and ætiology are unknown. It may be that the small blood vessels are damaged primarily, with the brunt of the attack falling on the periadventitial tissue, where there is a toxic or allergic type of cellular infiltrate of neutrophils, eosinophils and polymorphonuclear debris. There also appears to be an obliterative replacement of these vessels by young fibrous tissue. Apparently the diffuse infiltrate is also ultimately replaced by fibrosis. The presence of copious blood pigment further emphasizes the suggestion of vascular damage. Neutral fat and doubly refractile bodies have been reported in some cases, though their significance is not clear, but they are possibly derived from subclinical hæmorrhages.

This condition appears to be purely localized, without systemic manifestations. The age of onset, clinical appearance, localization and histopathology classify the present case as a typical example of granuloma faciale.

Summary.

An example of granuloma faciale with typical clinical and histological findings is described. The pathogenesis is discussed.

Acknowledgements.

I wish to thank Dr. L. A. Musso for the histopathological examination and helpful advice, and the medical photography departments of St. Vincent's Hospital and Sydney Hospital for the photography.

ADVANCED ABDOMINAL PREGNANCY.

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ALTHOUGH advanced abdominal pregnancy is rarely encountered, it represents one of the most hazardous complications of child-bearing. Until recent times, the mortality rates for both mother and child were formidable, and even now these rates are still high, being in the region of 10% and 70% respectively. Owing to the rarity of the condition, the diagnosis is seldom made before the death of the fœtus and frequently not until the time of laparotomy. Even in those pregnancies in which the fœtus is living and viable, wastage is considerable, owing to both inanition and congenital deformities. The major factor responsible for these depressing results is the abnormal site and nature of placentation. This is frequently in close relation to vital structures in the abdomen, which may be readily damaged during removal of the placenta. In addition, the vascular attachments of this latter organ do not lend themselves readily to surgical control, should hæmorrhage be considerable.

One of the earliest reviews on this subject was that of Werder in 1894, in which he described a successful cœliotomy in a case of ectopic gestation proceeding to viability. Other reviews in the present century have been those of Cornell and Lash covering the years 1919 to 1932, in which there were 236 cases, including 10 of their own. However this series was not restricted to advanced cases. Hellman and Simon's (1935) series of 311, with the report of five additional cases, covered the years 1809 to 1933. Cases of more than seven months' duration reported in the literature, from the time of the last-mentioned review until 1948, have been tabulated in the review by Ware (1948). In this representative survey, the maternal mortality was 14·85%, while the fœtal mortality was 75·6%. Of the 190 deaths in the latter group, 140 were still births and 50 were neonatal deaths.

Further reviews, which include interesting historical surveys, have been given by Beacham and Beacham (1946) and by King (1954). The less common extraperitoneal or intraligamentary type of abdominal pregnancy has been reviewed by Kobak *et alii* (1955). The case which is reported below is of the latter type, and illustrates many of the general features of abdominal pregnancy, and the problems which may be encountered in its management.

Clinical Record.

Mrs. W., aged 33 years, was first admitted to the Royal Women's Hospital on March 22, 1958, having been referred by a practitioner in the country who had supervised her earlier ante-natal care. It was noted in the letter accompanying the patient that at the third month she had been in hospital for over three weeks with a threatened miscarriage. In the third trimester her blood pressure had risen from 120/85 to 160/100 mm. of mercury over a period of 10 days, and this rise was associated with an excessive gain in weight. Accordingly, she had received hypotensive and diuretic agents and rest. It was stated that she had not cooperated in the latter treatment. On questioning, it was noted that the patient had been married for eight years without any previous conceptions. She was uncertain of the time of her last normal menstrual period. She thought it might have been at the end of July, 1957, so that her confinement appeared to be due in the first week of May, 1958.

On examination of the patient, her temperature and pulse rate were normal, her blood pressure was 140/90 mm. of mercury, and there was some œdema of the ankles and fingers. The urine was clear of albumin. The patient's weight was 217·5 pounds. Owing to the obesity, it was difficult to be sure of the abdominal findings; however, the fœtal head was thought to be presenting. The height of the fundus corresponded to a 34 weeks' gestation. The fœtal heart, although difficult to hear, was present and regular. The maternal hæmoglobin value was 12·5 grammes per 100 ml.

Treatment was continued with rest, and a protein-rich, salt-poor reduction diet of 1724 Calories per day. Hypotensive agents in the form of reserpine (0·75 milligramme per day) and pentolinium (60 milligrammes per day) were given, and a course of ammonium chloride (8 grammes per day) was started. Over the 14 days that the patient was in hospital she lost nine pounds in weight, and her blood pressure settled to a satisfactory level, being 130/80 mm. of mercury. During this period the patient complained of a brownish vaginal discharge. On speculum examination, it was noted that the cervix was difficult to visualize. There was some yellowish-brown discharge in the vagina, culture of which yielded some anaerobic streptococci and anaerobic Gram-negative bacilli. The urine contained a few pus cells and red blood cells; there was, however, no growth on culture.

Over the next six weeks, the patient was admitted to hospital on three occasions for rest and control of weight or blood pressure. The latter was labile, and fell to normal levels with rest. On the second admission, a vaginal examination was performed in view of the difficulty of abdominal palpation. The cervix was felt to be firm; it was two inches long, and the internal os was tightly closed and did not admit the tip of the finger. The whole cervix was displaced somewhat upwards and anteriorly behind the symphysis pubis. The presenting part was still thought to be cephalic, but an X-ray examination was performed in view of the uncertainty. This showed a single fœtal skeleton to be present, which, at the time of examination, was presenting by the vertex in the right occipito-posterior position (Figure I).[1]

On May 9, about the time when the patient's confinement was thought to be due, the cervical findings were unchanged. and medical stimulation was undertaken in an effort to ripen the cervix and bring the patient into labour. No contractions at all were observed. Five days later an infusion containing 10 units of synthetic oxytocin to the litre also failed to produce satisfactory labour. It was considered that the patient was probably in error by one month in her dates, and she was referred to the ante-natal clinic. Diarrhœa for which no cause was found had been present for two days over this period.

Three days after this, the patient returned complaining of recurrence of the diarrhœa over the previous two days with loss of appetite. In addition, she had noticed intermittent low back pain, which radiated anteriorly. She had not felt fœtal movements for 12 hours. On examination of the patient, no abdominal contractions could be palpated, and the fœtal heart could no longer be heard. The patient said that she was tender all over the abdomen. Over the next three days no movements were felt, and it was reasonably certain that fœtal death had occurred. A further "Pitocin" infusion produced only "very mild contractions". It was at this stage that an unusual location of the pregnancy was suspected, and the patient was examined under general anæsthesia. Only with the whole hand in the vagina could the examining finger be passed through the internal os. No membranes or fœtal parts could be palpated; the latter could be felt lying outside and behind the cavity of the uterus. Radiological examination, including the injection of radio-opaque material into the uterine cavity, was then carried out. The appearances in the hysterosalpingogram are shown in Figures II*a* and II*b*. The opaque medium was seen to outline clearly the cavity of the uterus and the left Fallopian tube, which was elongated and tortuous. Confirmation of the extra-uterine location of the fœtus was thus obtained. In addition, Spalding's sign was now present.

With six pints of cross-matched blood available, laparotomy was undertaken on May 27. Figure III is a photograph taken after the abdomen had been opened. The uterus, enlarged to the size of a 14 to 16 weeks' pregnancy, was presenting in the lower part of the incision. It was displaced anteriorly and to the left by the sac of the extrauterine gestation, and its posterior surface was firmly attached to the sac by numerous dense adhesions. The sac itself occupied most of the abdominal cavity and appeared to be contained within the layers of the right broad ligament. The round ligament on the right side was prominently displayed as it ran over the lower and anterior wall of the sac. A short distance above the level of the umbilicus, there were numerous adhesions of omentum and small bowel to the anterior and upper surfaces of the sac, and large blood vessels were seen coursing over its wall.

A 20 gauge needle attached to a syringe was inserted into the anterior wall of the sac in several places to ascertain its thickness and vascularity. An oblique incision was then made in the sac wall which, when extended, ran upwards and to the left from the right round ligament. After both feet had been secured, the fœtus was very gently delivered. The cord was cut short and tied with catgut. Moderate bleeding from the incised edges was controlled by the application of a clamp and the insertion of running sutures. Despite the fact that no exploration of the sac had been made, a small amount of bleeding was noted to be coming from its depths. This

[1] For Figures I, II*a* and II*b* see art-paper supplement.

may have been related to the extraction, the tying of the cord or the injection of ergometrine which had been given. The placenta appeared to be implanted into the upper part of the sac, with its lower edge just reaching the margin of the incision. The latter was not closed, as the sutures cut through the friable tissue, with resulting further hæmorrhage.

After hæmostasis had been secured with the aid of hot packs and some "Oxycel" gauze, the abdomen was closed in layers without drainage. One pint of blood was given during the operation, and another pint transfusion was running as the patient left the operating theatre.

After the operation the patient was given a course of chloramphenicol in an attempt to prevent infection in the sac. Her progress in the first week was satisfactory apart from paralytic ileus, which persisted through this period and necessitated intermittent gastro-intestinal suction and intravenous therapy. For some days it was noted that her urine was a dark brown in colour; this was presumed to

FIGURE III.

Findings at laparotomy. The enlarged uterus is lying in front of the gestation sac. Tortuous vessels can be seen running over the surface of the sac where it is exposed to the right of the uterus.

be from the absorption of pigments from the sac. In the second week, a small amount of consolidation appeared in the lower lobe of the left lung. This cleared fairly quickly. On the eleventh day after operation about 10 to 12 ounces of dark, rather offensive fluid and clotted blood drained from the centre of the abdominal wound. Bacteriological examination of this indicated a mixed infection, *Clostridium welchii* being the main organism present. Heavy doses of penicillin and gas-gangrene antiserum were given, the latter in a dosage of 40,000 units by intramuscular injection and 60,000 units into a vein. At this time her hæmoglobin value was 10·5 grammes per 100 mls. and the white cell count was 40,000 per cubic millimetre. A blood transfusion of two pints was given, and the temperature and pulse returned to normal.

By the fourth week after operation, the temperature had still not been satisfactorily controlled. At this time, a course of "Terramycin" was started, and during this therapy an enzyme combination of streptokinase and streptodornase was given intramuscularly, in a dose of 5000 units every 12 hours for five days. In addition, neomycin ointment was liberally applied to the dressing covering the opening of the sinus. Over the next few days, large pieces of apparently organized blood clot were passed, and there was some increase in the amount of the discharge. After this, although a continued intermittent pyrexia was present, the patient's general condition steadily improved. Aches and pains in the back and abdomen, which had been her chief complaint, soon disappeared.

On August 9, the patient passed four pieces of placental tissue, the largest measuring 6 by 4 by 4 cm., and her temperature immediately settled to normal. A small amount of brownish-red discharge persisted from the abdominal wall sinus. The size of the abdominal mass had slowly decreased during the post-operative period. After the expulsion of the placental tissue, this involution was considerably hastened. For the first time a clear delineation of the uterus from the extrauterine mass could be obtained on vaginal examination.

On August 15, the patient was discharged from hospital. When she was examined six weeks later in the follow-up clinic, the sinus had closed completely, and the patient was in excellent health. Although the remains of the gestation sac could be palpated in the pelvis, behind and to the right of the uterus, no tenderness was elicited.

Discussion.

Incidence.

The true incidence of the condition of abdominal pregnancy is difficult to arrive at, as one must depend on cases reported in the literature. Few individuals or even institutions accumulate enough cases to give an over-all picture. Some of the larger single series include a considerable percentage of referred cases. There will usually be a relatively higher incidence of the condition in hospitals which cover a wide area, especially if the standard of ante-natal care in the population is low or non-existent. The importance of the latter factor is shown by the analysis of Zuspan *et alii* (1957). These authors noted that among clinic patients the ratio of abdominal to normal pregnancies was 1:782, whilst no abdominal pregnancies were found among a comparable series of private patients. This factor is also stressed by Vasicka *et alii* (1956).

Hibberd (1957) stated that few abdominal pregnancies should progress to fœtal viability, because in almost every case there are early symptoms and signs of ectopic gestation which, if properly evaluated and dealt with, would result in earlier surgical intervention, with a correspondingly higher percentage of complete primary operations. The incidence given by Hibberd is 1:3000 of all births and 1:40 of ectopic pregnancies. Mall (1915) states that approximately 1:100 ectopic pregnancies proceed to term. According to Zuspan *et alii* (1957), the incidence of abdominal pregnancy reported in the literature varies from 1:286 to 1:15,000 of all births. The corresponding figure for the less common intraligamentary pregnancy is given by Kobak *et alii* (1955) as 1:49,765. The largest single series is probably that of Charlewood and Culiner (1955) in Johannesburg—52 cases observed over a period of 20 years.

Diagnosis.

Most authors stress that these patients are often in their fourth and fifth decades, and frequently have a history of infertility prior to their present pregnancy (Yahia and Montgomery, 1956). The importance of a prior episode of pelvic inflammation is not established, but is strongly suggested by the figures of Colvin and McCord (1934), who reported such a history in 13 of their 16 cases. Zuspan *et alii* (1957) also think it to be a significant factor, whereas opposite findings were noted in Reel and Lewis's (1936) cases.

The difficulty of arriving at a correct diagnosis depends partly on the rarity of the condition, but also on the fact that many of the typical symptoms and signs can occasionally occur in intrauterine gestations. However, as was stressed previously, a history of significant disturbance to the pregnancy in the first trimester is rarely absent. In many cases this occurs earlier than is usual with ectopic pregnancies, as the trophoblast becomes relatively less invasive and capable of secondary implantation in the latter part of the first trimester. This early occurrence is not a general rule, as in some cases the embryonic sac alone escapes from the tube with the placental attachment remaining wholly intact.

Lower abdominal or back pain, which may be unilateral, is seldom absent at this stage. It may be quite severe, and giddiness or syncope may occur. A pink, red or brown vaginal discharge is frequently associated with this. If unusual symptoms and signs persist after such a history, strong suspicion that the pregnancy is continuing in an extrauterine site should be entertained.

Apart from such evidence of disturbed placentation, upsets most frequently observed are those involving the gastro-intestinal tract. Anorexia, with nausea and perhaps vomiting, and change in bowel habit are noted, but are more significant if persisting into the second trimester. The patient may also complain of localized or generalized abdominal tenderness, and if she is a multigravida, may note that fœtal movements are more painful than in previous pregnancies.

When the patient is examined, there is often little in the contour or size of the abdomen to arouse suspicion. The exact period of amenorrhœa in these cases is often difficult to estimate, owing to the patients' poor recollection of menstrual history resulting from long periods of infertility and increasing age. In addition, there is often irregular vaginal bleeding after the pregnancy has commenced. The most important examination, if its findings are correctly assessed, is the palpation of the uterus apart from the gestation sac. Often the separate mass, if it is palpated, is regarded as an accessory horn or some type of neoplasm. Frequently the mass is firmly adherent to the uterus, and even with bimanual examination under anæsthesia it may not be separately distinguished, especially if the pregnancy is advanced (Murless *at alii*, 1949). An abnormal position of the cervix is of considerable importance, although significant displacement may occur with intrauterine pregnancies, even when uncomplicated by a pelvic mass. Usually the cervix is described as being higher in the pelvis than normal and displaced anteriorly. However, displacement in other directions may occur. An unusually long canal, with little or no softening, is suggestive. Tenderness on pelvic examination is sometimes a feature. Abdominal examination later in the pregnancy may demonstrate a high presenting part, malpresentations and undue closeness of fœtal parts and fœtal heart to the observer. Placenta prævia is often suggested. Only rarely, unless the diagnosis has been thought of, will absence of uterine contractions, either of the Braxton Hicks or pituitrin-induced type, be commented on.

In the natural sequence of events, unexplained fœtal death, with or without spurious labour, will next occur. Frequently, failure to induce labour, because of either inability to reach the internal os or unresponsiveness to uterine stimulants, will be experienced.

Radiological examination prior to clinical diagnosis is often unrewarding. Malpresentations, especially if the abnormal position is maintained over a period of time, are significant. The high position of the presenting part will often suggest placenta prævia to the radiologist. On lateral examination, fœtal parts may be noted behind the mother's vertebral column or close under the anterior abdominal wall. There will be no uterine shadow surrounding the fœtus, and constant bowel patterns may be seen in relation to the gestation sac on successive examinations. According to whether the sac is intraperitoneal or extraperitoneal, the fœtus may appear extended or unduly cramped. There may be evidence of fœtal death, such as Spalding's sign or collapse of other parts of the fœtal skeleton. Finally a radio-opaque substance can be employed to outline the empty uterus. This procedure presupposes a definite diagnosis, and is thus only of confirmatory value.

Theoretically, the majority of such pregnancies should be capable of early diagnosis, but this ideal is seldom realized. Charlewood and Culiner (1955) found that the diagnosis was made in only 12 of their 52 cases before fœtal death had occurred. Lull (1940), quoting Bodenheimer, states that in only 83 of 236 cases reviewed in the literature was the diagnosis made prior to operation. Kobak *et alii* (1955), in their review on intraligamentary pregnancies, state that the diagnosis in this particular type is hardly ever made prior to laparotomy.

Prognosis.

As far as the fœtus is concerned, the prognosis is very unfavourable. In discussing the fate of living, viable fœtuses, Suter and Wichser (1948) concluded that only about one-fourth of them would be born alive, and only a further half would survive the first week. In addition, a third of those born alive would be deformed, the abnormality affecting the cranium in about 75% of cases. These sombre figures are supported by those of Charlewood and Culiner (1955), who had 12 infants born alive in their total of 52, and of this number only four survived the first few days. Only seven cases of abnormality were recorded in the latter series, and not all authors have noted such high figures as Suter and Wichser. It would seem that the congenital abnormalities encountered in these children are due largely to the disturbance of the placental site in the early weeks of pregnancy.

As gestation advances, the placenta usually becomes increasingly inefficient in its nourishment of the fœtus, and so premature fœtal death is common. In view of the greater age of many of these patients, such diseases as hypertension are more frequently experienced, and may further contribute to the insufficiency of the placenta. Toxæmia of pregnancy, although it may occur, is not a feature. However, if it does occur, it may be severe enough to progress to eclampsia (Allen, 1933), and thus it is of interest in view of the statement that uterine distension may be related to the causation of this disease.

The maternal prognosis has steadily improved, the main factor in this being an appreciation of the correct management of the placenta. In addition, the availability of blood in adequate quantities, more effective antibacterial agents and improvements in anæsthesia have all combined to produce a decrease in maternal mortality, from 30% to 40% at the turn of the century to less than 10% at the present time. It is interesting that, even in 1934, Colvin and McCord reported that 100% of patients who were operated on had a morbid course thereafter, and 31·2% of them died.

Although pre-operative complications are relatively uncommon, rupture of the sac, especially if it is of the intraperitoneal type, may occur. This may be due to trauma; but cases of spontaneous rupture have been recorded (Giffen, 1955). Also, thrombophlebitis is thought to be more common than in intrauterine pregnancies.

Treatment.

The first question to be decided usually concerns the optimum time of interference. If the patient is examined early, most authorities agree that prompt intervention is necessary, delay being advisable only when the fœtus is near the period of viability. Such cases are somewhat comparable to pregnancies complicated by such diseases as diabetes mellitus, in which fœtal death in utero is not uncommon, particularly in the latter part of the third trimester. Weekly estimations of the urinary pregnanediol level may indicate failing placental function prior to actual fœtal death.

If the fœtus has died, some authors advocate a postponement of interference to allow a decrease in vascularity of the placenta to occur. Others advise laparotomy as soon as the diagnosis is established, as fœtal death is not regularly followed by a significant reduction in vascularity. Some idea of this relationship may be obtained by measurement of the excretion of placental steroid and gonadotropic hormones in the urine. Although these levels have usually fallen to normal by the tenth day, considerable amounts have been found as late as the 53rd day after fœtal death (Branscomb, 1947). Here it must be presumed that the placenta is viable, and has remained in functional communication with the maternal circulation. However, the chief reason for interference

is the ever-present possibility of infection in the decomposing sac. This may occur quite early, as in Touneau's case (1935).

When once laparatomy has been decided upon, it is important that an adequate amount of cross-matched blood shall be available. Hæmorrhage, of alarming severity, can occur in these cases, even with the slightest manipulations (Lull, 1940). As it may be difficult, by inspection alone, to determine the position of the placenta in relation to the wall of the sac, exploratory aspiration with needle and syringe may be employed to indicate the best site for incision into the sac. Prior indication of the situation of the placenta may be given by a study of the X-ray films. Even if it is not directly visualized, the placenta will usually be found lying opposite the ventral surface of the fœtus. These considerations are of some importance, since excessive hæmorrhage from the cut edges of the incision is difficult to control on account of the friability of the tissues forming the wall of the sac.

After delivery of the fœtus, a decision must be made regarding the feasability of removal of the placenta. Unfortunately, in cases which have progressed towards term, it is frequently difficult to tell, until the attempt has been made, whether or not profuse hæmorrhage is likely to occur. Factors favourable to immediate removal include a placenta which is discrete, of reduced vascularity and unattached to vital structures in the abdomen. There is no doubt that if it can be completely removed, convalescence is far safer and shorter.

In Zuspan's (1957) series when this had been the case, the average hospital stay of the patients was only 13 days, compared with 51 days for patients in whom removal of the placenta had not been possible. On the other hand, most maternal deaths in this condition are the direct result of severe hæmorrhage and shock following attempts at extirpation of the placenta. In Charlewood and Culiner's (1955) 52 cases, attempts at removal were made on 24 occasions and five deaths resulted. There were no deaths when the placenta was left undisturbed. There seems unanimity of opinion that marsupialization, drainage or packing will almost inevitably be productive of secondary infection and further complications (Spackman, 1933; Mason, 1940; Cross *et alii*, 1951).

If the placenta has been left *in situ*, the abdomen should be closed without drainage. An intestinal ileus is often present after operation in these cases, whether the placenta is removed or not, owing to the frequent attachment of placenta to bowel (Jeaffreson and Nathan, 1950). In a number of these cases, complete and uneventful absorption will occur. This is perhaps more likely if the pregnancy is intraperitoneal. The actual fate of the placenta, if left *in situ*, has been described by several authors who have had occasion to reopen the abdomen for other conditions. Millen (1956) reported a case in which operation was performed 32 months after delivery. The placenta appeared as a yellowish-white mass, measuring 5 by 5 by 4 cm., which was attached to the anterior abdominal wall and several loops of intestine. On microscopic examination the outline of the villi were still easily identifiable. Ware (1936), in another report, could find no trace of the placenta after 27 months had elapsed. Several authors (Nicodemas and Carrigg, 1940; Pearson and Parkes, 1944) have described cases in which a secondary removal of the placenta has been necessary because of abdominal symptoms, but this occurs in the minority of cases.

In patients who have survived with the placenta *in situ*, it has been noted that lactation is poor or absent, presumably owing to inhibition of the anterior pituitary lobe by the placental hormones (MacGregor, 1937).

As far as future child-bearing is concerned, there is little to be found in the literature. In many of the cases in which placental removal has been attempted, it has been necessary to remove the uterus as well to control hæmorrhage. In one series previously referred to (Charlewood and Culiner, 1955), only two out of the 52 patients were known to become pregnant subsequently; in both these cases the placenta had been left *in situ*.

In very rare cases, the condition may recur, and may even progress to full term (Hazlett, 1953).

Summary.

A case of advanced secondary abdominal pregnancy of the intraligamentary type is described. This patient's ante-natal course was complicated by hypertension, which may have contributed to the fœtal death "in utero" which occurred.

In the diagnosis of such cases, stress should be placed on the persistence of unusual symptoms following evidence of disturbed placentation in the first trimester. The most important physical findings are the presence of a mass separate from the uterus, and a marked displacement of the cervix from its normal position in the pelvis.

Ideally, patients with extrauterine gestation should be operated upon in the first half of the pregnancy. In cases when treatment is undertaken after the period of viability, complete placental removal becomes increasingly difficult and hazardous.

In the case described, owing to the attachment of the placenta to vital structures in the abdomen, no attempt at its removal was made. Usually this is the safest method of immediate management, although the post-operative course may be more morbid and prolonged.

Acknowledgements.

I am grateful to Dr. W. M. Lemmon for helpful suggestions in the management of this patient, and to Miss M. Johnson for help in the preparation of the photographs.

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Legends to Illustrations.

FIGURE I.— X-ray film taken on April 23, 1958.

FIGURES IIa and IIb.—X-ray films taken on May 26, 1958. The "Lipiodol" injected is shown passing into the empty uterine cavity, which is lying in front of the gestation sac.

GENERALIZED CYTOMEGALIC INCLUSION DISEASE IN THE NEONATE DIAGNOSED DURING LIFE.

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Two cases of cytomegalic inclusion disease have recently been diagnosed in maternity hospitals in Adelaide, the diagnosis in each case being confirmed by the finding of characteristic cytomegalic cells containing intranuclear inclusions in the urine during the life of the infant.

In the case we are presenting from the Queen Victoria Maternity Hospital the disease was diagnosed clinically by one of us (I.S.) on the first day of the infant's life, and confirmed by the other (R.O.) by microscopic examination of the urine passed by the infant on the third day of his life, as in the case reported by Fetterman (1952). We had recently studied the cytomegalic cells with intranuclear inclusions in the urine from the other baby in whom these cells were present in the first sample sent to the pathologist for examination of stained smears, and subsequently identified almost daily. Cytomegalic cells and bile casts were plentiful in the urine samples. The intranuclear inclusions were basophilic, but the cytoplasmic inclusions were often eosinophilic, particularly when the cell was beginning to degenerate (Figure III[1]).

The centrifuged deposit of the urine was smeared, dried and fixed in a 50% solution of ether-alcohol and stained with hæmatoxylin and eosin. The value of the stained smear of urine in the diagnosis of the condition during life is thus amply verified by our cases.

Clinical Record.

Maternal History.

After a miscarriage at six months a primipara, aged 20 years, had two menstrual periods, the last on March 10, 1958, followed by an apparently normal pregnancy. No abnormality was revealed on antenatal visits, the last visit being at 34 weeks' development, and no intercurrent illness occurred.

[1] For Figures I to V see art-paper supplement.

Labour ensued at 36 weeks and was complete after 12 hours. Some irregularity of the fœtal heart sounds occurred early in labour, and the liquor amnii was observed to be bright yellow when the membranes ruptured half an hour before delivery.

The vernix caseosa was then also found to be golden, and the placenta larger than normal for the fœtal size, with one-half thickened to a depth of 3 cm.

The Infant.

A male child of 36 weeks' gestation, weighing 1970 grammes, of normal development apart from talipes equinovarus of one foot, was cyanosed at birth and slow to breathe, with a weak cry; his head circumference was 29 cm.

When seen by one of us (I.S.) the appearance was striking, with intense jaundice of the body, scleræ and mucous membranes, on which were superimposed many discrete dark blue ecchymoses and petechiæ between 1 and 5 mm. in diameter, involving even the soles and the palms.

Œdema and ascites, expected in rhesus incompatibility of this severity, were absent, and anæmia was not suggested by mucosal colour. Marked hepatosplenomegaly caused gross abdominal distension down to the iliac crests, especially the left.

Reflexes were normal, and progress, though slow, occurred for a few days, being then succeeded by lethargy and sluggishness with excessive salivation, but no respiratory distress. Deep yellow urine and meconium were passed.

On the seventh day a melæna stool, followed by bright-coloured blood from the rectum and injection sites, culminated in a cord hæmorrhage.

In spite of vitamin K_1 injections, these manifestations persisted until the baby's death on the tenth day, unaccompanied by central nervous signs or cyanosis. The head measurements remained unchanged.

The serum bilirubin level rose from 12 mg. per 100 ml. at birth to 53 mg. per 100 ml. by the eighth day. The Wassermann reaction was negative, and no antibodies to toxoplasmosis were detected in the serum.

Marked thrombocytopenia was present at birth (platelets numbering 50,000 per cubic millimetre, rising to 66,000 per cubic millimetre on the eighth day). There was no anæmia; the hæmoglobin value of blood from a heel prick was 14·8 grammes per 100 ml. on the first day, rising to 20·6 grammes per 100 ml. on the eighth day, when hæmoconcentration had occurred from the hæmorrhages. Erythroblastosis of marked degree was indicated by normoblasts, 84 per 100 white cells, the latter numering 37,500 per cubic millimetre, with normal distribution. Red blood cells showed anisocytosis and polychromasia.

Diagnosis.

A presumptive diagnosis of generalized cytomegalic inclusion disease was made on the first day, based on clinical signs and prior knowledge of the mother's serology (group O, rhesus-positive, Wassermann-negative, anti-A hæmolysins in titre of only 1/16) and that of the baby (group A, rhesus-positive and Coombs-negative).

With the exclusion of iso-immunization as a major cause, the absence of intercurrent or hereditary disease in the mother and no signs of infection, an immediate search was instituted for cytomegalic inclusions in the centrifuged urine, and early success was achieved. Cytoplasmic inclusions were found in urine passed only eight hours after birth, and characteristic intranuclear inclusions on the third day.

X-ray examination of the skull and long bones failed to show the sclerosis or intracranial mottling described in this disease and in toxoplasmosis.

Differential Diagnosis.

The presence of this disease should always be suggested in a jaundiced neonate, but laboratory diagnosis is

essential, as the clinical picture is almost indistinguishable from that found in cases of severe rhesus incompatibility at 36 weeks. The syndrome described by several authorities is of an infant born prematurely or smaller than expected for the duration of pregnancy, intensely jaundiced at or soon after birth, with hepatosplenomegaly, erythroblastosis, petechial rash, hæmorrhagic manifestations and respiratory difficulty. Calcification is apparently not invariable and was absent here, although present in the other infant recently exhibiting the disease in Adelaide, and also in an earlier case from the Queen Victoria Maternity Hospital, which was diagnosed after autopsy and reported by Fowler (1956).

The following are other diseases to be excluded: (i) iso-immunization from rhesus incompatibility, (ii) iso-immunization from A B O incompatibility and rare antigens, (iii) toxoplasmosis, (iv) generalized herpes simplex infection, (v) sepsis, (vi) syphilis, (vii) infective hepatitis, (viii) congenital obliteration of the bile ducts, (ix) congenital hæmolytic anæmia.

Significant Necropsy Findings.

Necropsy was performed within three hours of the infant's death on December 6, 1958. Other than the appearance already given in the clinical description, the salient features were the gross enlargement of the spleen (35 grammes) and the liver (128 grammes). The spleen reached to the iliac fossa. Unlike the case in erythroblastosis, there was no ascitic or intrapleural fluid, though the pericardial fluid was icteric, as was the cerebro-spinal fluid. This gave a yellow appearance to the cortical surface of the brain, though on incision there was no kernicterus. The brain was firm and of normal consistency. When the cerebellum was being removed, a large hæmorrhage, 2 cm. in diameter, bulged from the posterior surface of the cerebellum, partly in its substance and compressing the medulla; this was, no doubt, the immediate cause of the death of the infant. It would have been of special interest to know if the inclusions were present in the placenta. Regrettably this was not saved for pathological examination.

Histological examination showed large numbers of typical inclusions in the kidney, lung, epididymis and pituitary gland; less numerous inclusions in the submaxillary gland, liver and pancreas; and in an occasional cell only in the myocardium. No cytomegalic cells were seen in sections of the adrenal gland, spleen, gut, brain, sternal marrow or thyroid, though serial sections of these organs were not made. Extramedullary hæmopoiesis was present in many organs—the lung, kidney, adrenal, spleen, testis and epididymis, submaxillary gland, lymph nodes and pancreas. Some of these features are illustrated in the photomicrographs (Figures I, II, IV and V).

Discussion.

This disease was first reported in a stillborn luetic fœtus by Jesionek and Kiolemenoglou in 1904, and has received increasing prominence in the literature in succeeding years. Reviews on the subject have been published from time to time, notably by Cappell and MacFarlane (1947), Wyatt (1950), France (1951) and Medearis (1957), while additional knowledge of the disease has been contributed by reports from Goodpasture and Talbot (1921), Faber and Wolbach (1932), Kinney (1942), Worth and Howard (1950), Fetterman (1952) and Margileth (1956). The annotation in *The Lancet* (1957) summarized most of the existing knowledge, including the work of M. G. Smith (1956) on the passage in tissue culture of the causative virus, and more recent experimental work and new observations are reported by Vogel (1958) and Guyton *et alii* (1957).

As Cappell and MacFarlane noted (1947), the disease in neonates was originally associated with syphilis in early literature, but later became linked with "hæmolytic disease of the newborn". Some confusion arose because of the association with salivary gland inclusion bodies in predominantly asymptomatic cases in older children and adults presenting terminally and in varied syndromes. Finally, the clinical picture in the neonate, where the disease is usually fatal, has emerged as a definite entity and, as Claireaux (1958) points out in his informative and concise description, the diagnosis can be suspected in the neonate "when an infant shows signs of a hæmolytic process without evidence of iso-immunization".

The first recorded case in South Australia (also of a patient born at the Queen Victoria Maternity Hospital in 1956) was described by Fowler (1956), Colebatch (1955) being the first to refer to the disease in the Australian literature. Willis (1958) asserts this disease is "far from rare", though the total number of cases reported in the neonatal age group is not high, and the number recognized and confirmed as such during life exceedingly small as yet. However, increasing awareness of the clinical presentation and the ease of confirmation of diagnosis by examination of stained smears of urinary deposit are leading to recognition of other cases *in vivo*, so that viral and experimental studies can be furthered.

Another feature of interest in recorded literature was made by Alexander (1953), who points out that the prognosis for future pregnancies is good, as mothers who have had one baby die of this disease have subsequently delivered normal infants. Bellamy (1954) offers as evidence for transplacental infection a pregnancy in which twin babies contracted and subsequently died of this disease.

Summary.

A fatal case of generalized cytomegalic inclusion disease in a neonate is reported, after delivery at 36 weeks' gestation. The diagnosis was made clinically on the first day and confirmed on the third day by microscopic examination of stained smears of urinary sediment. Autopsy, after death on the tenth day, confirmed the diagnosis, and typical intranuclear and cytoplasmic inclusions were found in many organs, in addition to areas of extramedullary hæmopoiesis.

The disease as a clear-cut entity is described, and a plea made for consideration of the disease as a cause of neonatal jaundice when iso-immunization can be excluded. The literature has been reviewed and the recent emergence of the neonatal form has been emphasized.

Acknowledgements.

We wish to thank Dr. Ralph A. Thatcher for his kind permission to publish this report; Dr. E. G. Hardy, of the Institute of Medical and Veterinary Science, Adelaide, for permission to perform the autopsy; and Mr. W. Nolan for his help with the photography.

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Legends to Illustrations.

FIGURE I.—Low-power view of kidney tissue. There is slight cystic dilatation of those tubules which contain the cytomegalic cells with typical "bird's eye" intranuclear inclusions. (Hæmatoxylin and eosin stain, × 100.)

FIGURE II.—High-power view of kidney showing the inclusions. Portion of a hæmopoietic focus is also shown in this view. (Hæmatoxylin and eosin stain, × 450.)

FIGURE III.—Typical cytomegalic cell from urine showing both cytoplasmic and intranuclear inclusions. (Hæmatoxylin and eosin stain, × 450.)

FIGURE IV.—High-power view of a tubule of the epididymis containing cytomegalic cells, two with cytoplasmic, and one with intranuclear inclusions. (Hæmatoxylin and eosin stain, × 450.)

FIGURE V.—Low-power view of pituitary gland with a large focus of cytomegalic cells. (Hæmatoxylin and eosin stain, × 100.)

Reviews.

Health in Industry. *By Donald Hunter; 1959. Mitcham:* Penguin Books Inc. 7" × 4", pp. 288, with illustrations. Price: 6s.

MEDICAL and allied publications by Penguin Books provide means of securing at a very small cost authentic and up-to-date information on a number and variety of current topics of importance. This volume of the Pelican Medical Series by Donald Hunter, already well known as author, investigator and teacher in the field of industrial medicine, is no exception. It offers very good value for the money, and is surprisingly comprehensive in scope. According to Hunter in his preface, it is intended for the use, not only of undergraduates in medicine, science, arts and law, but also of general practitioners, medical consultants and various non-medical but essential personnel connected with industry.

The introduction contains pertinent sections on the training of medical students and industrial medical officers. It is then pleasing to see a whole chapter devoted to the historical aspects of industrial medicine, a field in which Donald Hunter excels, and to note that Thackrah, the British pioneer, has been awarded due recognition.

Some portions of the chapter on legislation are specially relevant to Britain, but the sections on rehabilitation and human relationships should not be passed over by the Australian reader. In the chapter on accidents, an important and expensive problem to industry, there is a general consideration of causes, including accident-proneness and the prevention and treatment of injuries, and references are given to hazards in certain specified types of employment.

With regard to poisoning by metals, only those of special health significance are mentioned, the essential points being emphasized. Lead takes pride of place, and the other metals discussed are mercury, arsenic, manganese, nickel, chromium, beryllium, cadmium and vanadium. A description of the toxic effects of each metal is followed by brief notes on prevention and treatment of poisoning. Similarly, in the account of poisoning by organic compounds, those which are particularly important from the health aspect are included—notably benzene and six other coal-tar derivatives, carbon tetrachloride and five other halogenated compounds, tetra-ethyl-lead, organic mercury compounds, organic arsenic compounds and the organic phosphorus insecticides.

The chapter on dust diseases contains an adequate description of silicosis and an effective account of the occupations in which this disease may occur. The preventive measures are well set out, and the statement that a respirator must never be used as a lazy excuse for avoiding dust control will have full support from industrial medical officers in this country. This chapter also includes a discussion of pneumonoconiosis of coal miners, asbestosis and byssinosis.

In the concluding section, entitled "Other Occupational Diseases", consideration is given to a variety of disabilities, including certain infections, compressed-air illness, cramps, injuries from radioactive sources, skin diseases and cancer. Finally, there are a useful glossary of technical terms and a reasonably comprehensive bibliography.

This book should be of value to all who are concerned in the task of providing and maintaining safe and healthy working conditions in industry.

Bacteriophages. *By Mark H. Adams, with Chapters by* E. S. Anderson, J. S. Gots, F. Jacob and E.-L. Wollman; Electron Micrographs by E. Kellenberger; 1959. New York: Interscience Publishers. 9" × 6", pp. 612, with 13 illustrations and 25 tables. Price: $15.00.

MARK H. ADAMS died towards the end of 1956, before this book was completed. The editorial responsibility was taken over by A. D. Hershey, who was assisted with rewriting and additions by such authorities as Bertani, Delbrück, Herriott, Lanni, Weigle and others. The publication appears to have lost no continuity of thought or presentation, and indeed may have gained much as a result. There is a total of 592 pages, clearly printed on good paper. Exclusion of glossary, appendix and author and subject indices leaves 437 pages of text. The contents of each chapter are presented in note form in the 10 pages preceding the introduction. A small summary at the conclusion of many chapters will be found helpful. The subject matter has been presented concisely and with clarity, and set out with such order and simplicity that every aspect covered should be easily comprehended by both student and specialist alike. The complex literature on phage has been selected with skill. The coverage is not exhaustive. There is, however, no reference to the drying and preservation of bacteriophages. The glossary of terms covering four pages is particularly useful for those not thoroughly familiar with phage research and techniques.

The appendix—"Methods of Study of Bacterial Viruses"—comprises 80 pages of text which originally appeared in 1950 in volume 2 of "Methods in Medical Research". This has received only slight modification in the hands of Hotchkiss and Bruce.

Delbrück, in the preface, points out how phage research has become interwoven with genetics, biochemistry, virology and immunology, and concludes: "Accordingly we now have before us, for the first time in 30 years, a book on bacteriophages, reasonably complete, reasonably up to date, and reasonably elementary."

This book, therefore, is an extremely valuable contribution to the rapidly expanding literature on phage, at least in so far as there is no other publication to date which is as comprehensive, as easily read, or as up to date in the broad biological sense.

Cunningham's Manual of Practical Anatomy. Volume II: "Thorax and Abdomen". Revised and edited by James *Couper Brash, M.C., M.D., D.Sc., LL.D., F.R.C.S. (Ed.),* F.R.S.E.; Twelfth Edition; 1958. London: Oxford University Press. 7½" × 5", pp. 594, with 237 illustrations. Price: 51s. 6d. (English).

THE latest edition of this excellent practical manual is now completed by the appearance of the volume devoted to thorax and abdomen. The late Professor J. C. Brash died while this volume was in early proof form, and it was helped through the press by Professor G. J. Romanes, who succeeded Brash to the chair at Edinburgh. Brash had been the editor of the last four editions of this book, which has for long upheld the Edinburgh tradition in anatomy; his guiding hand and great wisdom will be sorely missed.

As was pointed out in the reviews of the other volumes, the Paris nomenclature has been introduced, but so far as the student is concerned, the changes in terminology have been kept to a minimum.

It is good to see a description and illustrations of the broncho-pulmonary segments added to this edition; in our opinion, a colour plate could have been used here with

greater advantage. Some of the old drawings and X-ray pictures have been replaced by new ones. The only major change has been to alter the order of dissection of the perineum, which now comes logically before the dissection of the pelvis and not, as formerly, before that of the abdomen.

It is a pity that circumstances have dictated the piecemeal issue of the various volumes of this edition. The present volume can only enhance the already very high reputation of the whole work. It will, for a very long time, continue to be the manual of choice in anatomical schools all over the English-speaking world.

Manual of Chest Clinic Practice in Tropical and Sub-Tropical Countries. By A. J. Benatt, M.D.; 1959. Edinburgh and London: E. and S. Livingstone, Limited. 7¾" × 4¾", pp. 108, with illustrations. Price: 10s. 6d. (English).

THIS is only a small book of a hundred pages, and very easy to read. An introductory note states that it was written to help those who may have to treat tuberculosis under difficulties. Although there is a great deal that would be applicable to any chest clinic, its usefulness would be essentially for those treating tuberculosis under primitive conditions. Statements such as "to put a seriously sick person on the floor except under exceptional conditions, is inadmissable" would hardly apply to a modern chest clinic.

Although the title of the book mentions tropical and subtropical countries, there is nothing that is especially applicable to these conditions. Accordingly the title is not a good one. Perhaps it can be explained by the fact that Benatt worked for the World Health Organization (UNICEF) in Thailand and Tunisia.

The method of dealing with patients and contacts is described. The advice given is correct; but much of it is elementary and would be of more use to the layman than to medical personnel.

The staff required for a chest clinic and their duties are enumerated. All the equipment that is necessary is set out in great detail.

Approximately half the book is devoted to techniques. This section describes in detail such things as the methods of collecting sputum, and laryngeal swabs which are recommended in preference to gastric lavage, tuberculin testing and B.C.G. vaccination.

One criticism that could be made is that in such a small book rather undue emphasis is placed on the management of the diabetic tuberculous patient. Furthermore, it seems strange that in the discussion of the techniques associated with a chest clinic, one-quarter of the space is used in describing urine tests.

This book would be of most use to someone faced with the problem of organizing a chest clinic in some undeveloped country. To such a person it would be of considerable help.

A Manual of Anæsthetic Techniques. By William J. Pryor, M.B., Ch.B. (N.Z.), F.F.A.R.C.S. (Eng.), D.A. (Eng.), F.F.A.R.A.C.S., with a foreword by the late J. H. T. Challis, M.R.C.S. (Eng.), L.R.C.P. (Lond.), F.F.A.R.C.S. (Eng.), D.A. (Eng.); Second edition; 1959. Bristol: John Wright & Sons Limited. 8¼" × 5¼", pp. 240, with 75 illustrations. Price: 27s. 6d. (English).

THE second edition of W. J. Pryor's "Manual of Anæsthetic Techniques", although slightly enlarged, maintains the form and style of its predecessor, and like it offers sound advice for the conduct of anæsthesia in a large variety of surgical operations. Thus it deals with the generally accepted anæsthetic methods of today, moving progressively from the requisite apparatus and drugs through the various standard procedures to certain special considerations and applications. The presentation, mainly in the form of brief synopses, is most concise and generally adequate; but some obscurity inseparable from this style is evident from time to time. Nevertheless it is a good and practical book, and the early necessity for a new edition indicates its popularity and usefulness, particularly among those wanting something more than elementary guidance in a rapidly-developing speciality.

The illustrations are excellent, especially those of apparatus and accessories. Perhaps the anæsthetic and other trolleys look rather cluttered, suggesting the hazard of soiling clean articles, but no doubt in practice many of these would be kept in some drawer or other handy place. Although mentioned twice in the text, no nasopharyngeal tubes are shown here. The diagrams of the closed and semi-open circuits are good, and will be very useful to those who have rather hazy ideas about these important features of modern machines. The book is beautifully printed in large clear type on excellent paper, with not more than three or four typographical errors—a tribute to the publishers.

There are, however, some features that invite criticism and possible remedies. The frequent use of the gerund as a preposition is irritating—thus "techniques using relaxants" would be more tolerable if "with" was the operative word. The term "aspirated" is employed to indicate both sucking-out and sucking-in, especially with regard to the respiratory tract. The "double harness holder" illustrated is really a double-tubing holder. "Competition inhibitors" are really competitive inhibitors, and "anoxic hypoxia" is an impossibility. Indeed, the definitions of hypoxic and anæmic hypoxia are seriously wrong, as reference to standard books on physiology will show. The commendable priority accorded to pharmacopœial over trade names should be extended to halothane and niketh-amide, and the fact that nitrous oxide will support combustion should be listed among its properties. Two surprising omissions concern the useful relaxing agent decamethonium and, except by implication, the technique of anæsthesia for cleft-palate operations. Again, the techniques recommended for nitrous oxide and oxygen, either "straight" or supplemented, would seem to be too asphyxial for current taste.

Various defects of style and composition could be quoted, but these do not detract significantly from the quality and intelligibility of the book. Indeed, in its latter half better writing seems to be evident, for which the contributing writers are by no means entirely responsible. There is no doubt that further improvement in this regard will secure for this work sustained popularity and heavy demand.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Science News", Number 52, edited by Archie and Nan Clow; 1959. Mitcham, Victoria: Penguin Books, Pty. Ltd. 7" × 4", pp. 128, with illustrations. Price: 4s.

Contains seven articles and a research report.

"A Synopsis of Obstetrics and Gynæcology", by A. W. Bourne, M.A., M.B., B.Ch. (Cambridge), F.R.C.S. (England), F.R.C.O.G.; Twelfth Edition; 1959. Bristol: John Wright & Sons Ltd. 7¼" × 5¾". Price: £1 15s.

This edition has been completely revised.

"Postural Drainage and Respiratory Control", by E. Winifred Thacker, M.C.S.P.; Second Edition; 1959. London: Lloyd-Luke (Medical Books) Limited. 7½" × 4½", pp. 72, with 37 illustrations. Price: 10s. 6d. (English).

A few amendments and changes have been made in this edition.

"An Introduction to Surgery for Dental Students", by R. P. Jepson, F.R.C.S., and B. N. Catchpole, F.R.C.S.; 1959. London: The English Universities Press, Limited. 8¼" × 5¼", pp. 176, with 53 illustrations. Price: 39s. 3d.

Designed to introduce the dental student to the principles of surgery and, in particular, to the principles of general surgery which are applicable to his own specialty.

"First-Cousin Marriages in Sweden 1750-1844 and a Study of the Population Movement in Some Swedish Subpopulations from the Genetic-Statistical Viewpoint", by Carl Henry Alström. *Acta Genetica et Statistica Medica*, Vol. 8, No. 3/4, Separate number; 1958. New York: S. Karger. 10" × 7", pp. 175, with tables. Price not stated.

The title is self-explanatory.

"Methods of Geographical Pathology". Report of the Study Group convened by The Council for International Organizations of Medical Sciences, established under the joint auspices of UNESCO and WHO; Edited by Richard Doll; 1959. Oxford: Blackwell Scientific Publications. 8¼" × 5¼", pp. 72. Price: 9s. 6d. (English).

The report of a meeting held in July, 1957.

The Medical Journal of Australia

SATURDAY, OCTOBER 31, 1959.

THE CONTRIBUTION OF THE LIFE INSURANCE FUND TO MEDICAL RESEARCH.

In the years following the Second World War it became apparent that Australia and New Zealand were lagging in financial support of medical research in many fields. The Life Offices' Association for Australasia, recognizing this, agreed in 1952 to establish a fund to support research in the field of cardio-vascular function and disease. An important factor determining this decision was the knowledge that the mortality rate of diseases of the circulation was more than twice that of cancer, the next major killer. In November, 1952, a constitution was drawn up in terms of which a Committee of Management was appointed, consisting of chief executives of the Life Offices, a Medical Director and an Advisory Council representative of scientific and medical research interests in Australia and New Zealand. Contributions to the Fund commenced at the rate of £25,000 per year, were increased to £35,000 in 1957 and have been increased to £50,000 this year.

To stimulate and encourage research it was decided to use the resources of the Fund by awarding grants-in-aid and fellowships. The fundamental policy was thus to support both men of acknowledged research ability and those who showed real capacity in this direction. It was hoped by this means to attract men of ideas and character who wished to dedicate themselves to a life of scientific investigation, in the belief that they would eventually make a significant contribution to the personnel of research institutes in both dominions. On the basic conviction that the principal seed-bed of research is in the universities, affiliated hospitals and research institutes, it was decided to support men working in such institutions. On the further belief that man cannot effectively serve two masters, fellowships were restricted to full-time workers. Fellowships are tenable in Australia and New Zealand and also overseas. The local fellowships, designed to encourage suitable young men to submit themselves to research disciplines for a period in their post-graduate training, are awarded for an initial period of one year, but may be renewed. Travelling fellowships are awarded for a period of three years, the first two of which are spent abroad and the third in Australia or New Zealand; such fellowships are awarded only to men of proved research ability of the highest calibre. Grants-in-aid are awarded initially for periods of from one to three years to support specific research programmes and may be renewed for further periods. The salary of the head of the department or institute is not met by the Fund, but the grant covers the salaries of research associates and technicians. In special circumstances the cost of apparatus, essential for the research being supported and not normally part of the equipment of a research department, is also covered by the grant. From the inception of the Fund in 1953 until September, 1959, awards have amounted to £207,000, of which the amount of £159,500 has been for grants-in-aid and £47,500 for fellowships. The costs of administration have been £6000 (approximately 3% of the total awarded).

While six years is too brief a period for any detailed assessment, it can be claimed with confidence that the Fund has established itself firmly as one of unique importance in the ever-broadening field of medical research in Australia and New Zealand. Universities and medical research institutions have recognized the significance of this contribution from the business community towards clinical and fundamental research and are cooperating to the fullest extent to ensure the best use of the Fund. Its reputation has extended overseas and Sir Howard Florey has recently expressed admiration for the whole concept and for the manner in which it is operating. The first two of the Travelling Fellows have returned to Australia to university appointments, one now being an Associate Professor in the University of Sydney, the other a Senior Research Fellow in the Australian National University. Forty-five grants-in-aid have been given, and the quality of the resulting contributions made to scientific literature is most impressive. Within the broad spectrum of cardio-vascular function and disease both fundamental and clinical problems have been studied, and publications have appeared on such subjects as the structure of arterial walls, the dynamics of the circulation in health and disease, the causation and treatment of high blood pressure and coronary artery disease, and the development of new techniques in the field of cardiac surgery.

This is an impressive record of achievement, which must give the life insurance companies much satisfaction. They gave a most valuable impetus to medical research in Australia and New Zealand at a time when this was urgently needed. It is to be hoped that the Fund will retain its identity and continue to grow, perhaps widening its scope in the future. There are many other unsolved problems calling for intensive investigation, the solution of which will materially reduce the present load of morbidity. Psychosomatic disorders remain a major challenge in this regard. Meantime, it is very important that the medical profession as well as the general public should realize what is being achieved by this Fund and give it their fullest goodwill, interest and moral support.

A PROFESSIONAL RESPONSIBILITY.

All medical graduates of the University of Sydney are urged to vote in the election of 10 Fellows of the Senate of the University of Sydney to be held on November 12, 1959. For the 10 vacancies 35 candidates have offered; 10 of these (see page 662) are medical men. As we stressed a few weeks ago, medical graduates have a responsibility to see that they are adequately represented

on the governing body of each of our universities. It is not a question of the selfish representation of sectional interests, although it is important that informed medical voices should be heard when matters are discussed relating to the medical faculty and to the health and welfare of students generally; the greatest obligation is that graduates of a large and important faculty should serve their university at the top level. There is no lack of suitable medical candidates in the University of Sydney election. Let there be no lack of supporting votes.

Current Comment.

AORTIC HOMOGRAFTS.

As recently as 1950, in a paper on experimental work with arterial homografts in dogs by H. Swan and others,[1] it was stated that although it had been demonstrated 40 years previously by Carrel and Guthrie that fresh and preserved homografts properly transplanted might be expected to function indefinitely, "because of technical pitfalls . . . arterial homografts in the human have never been extensively used". This hesitancy has now been completely overcome by the technical advances of the present decade, and the last two or three years have seen the publication of a spate of reports, especially from America, of the results obtained in large series of cases of the replacement of sections of the aorta and great vessels by grafts and prostheses of various kinds. In the early stages of this work, emphasis was mainly on the use of arterial homografts, since it was naturally supposed that it was best to replace the diseased vessels by materials as near as possible to the original structure. However, the difficulty of obtaining homograft material forced the surgeons to experiment with synthetic materials, and it was soon found that tubes made from nylon and other synthetic fibres could be successfully used. Now that the technical difficulties of these procedures have been largely overcome, the main debate centres on the question of which material provides the best prosthesis. Arterial replacement has also been performed for long enough for it to be possible to get some idea of the late results of these procedures.

Against this background, recent reports of late fatal complications of the use of arterial homografts are of special significance, and tend further to strengthen the arguments in favour of plastic arterial substitutes for the aorta rather than homografts. In one such report, A. G. Sharf and E. D. Acker[2] of Los Angeles state that much experimental as well as some clinical evidence is accumulating that degeneration in the homograft proceeds at a far greater rate than similar changes in the host aorta. The persistence of elastic fibres for years with little degeneration was at one time thought to be satisfactory evidence in favour of the freeze-dry aortic homograft. However, autopsy studies have since been presented describing late alterations in the homograft with fragmentation of the elastica and aneurysmal dilatation at the site of anastomosis. The thickened but weakened intima and media of the homograft show evidence of degenerative changes, with deposits of calcium and cholesterol and fragmentation of elastic fibres. Sharf and Acker state that this degeneration possibly depends on the immunological reaction between the host artery and the graft, and that these changes culminate in two main complications, namely, stenosis and thrombosis of the homograft, and aneurysmal dilatation with subsequent rupture. They describe two cases in which late degeneration of the homograft led to fatal complications. In one, 15 months after the successful insertion of an aortic homograft, the patient was admitted to hospital with severe rectal bleeding; laparotomy was performed, and it was found that an arterio-enteric fistula had developed between the homograft and an adherent loop of jejunum. The bowel was repaired and the hole in the homograft was closed, but nine days later the repaired homograft again ruptured, this time with a fatal outcome. In the second case, the patient had originally presented with a Leriche syndrome, and the obstructed aortic bifurcation had been replaced by a bifurcation homograft. About 19 months later the patient's symptoms returned, and after a trial of conservative treatment a second operation was performed, at which the homograft was found to have contracted to a diameter of 1 cm. and to be filled with gelatinous clot. The homograft was replaced by a nylon prosthesis, but six weeks later a rupture occurred at the site of anastomosis, and the patient did not survive his third operation. Sharf and Acker comment that homografts which have failed because of degenerative changes should not be repaired, but should be replaced by a plastic substitute; they note that severe rectal bleeding and shock in patients with aortic homograft replacement should suggest rupture of the graft into the bowel lumen (this occurred at one stage in both their cases); and they suggest that, with the increased number of patients who have received arterial homograft transplants, replacement of degenerative arterial homografts as an emergency procedure is a contingency which should be considered in some communities.

In a somewhat similar report E. Senderoff, L. Blum and J. D. Baronofsky[1] of the Mount Sinai Hospital, New York, present a clinical and pathological study of three cases in which arterial homografts ruptured after initially successful transplant, in each case with fatal consequences. The homografts used had been sterilized with ethylene oxide; one had been preserved by deep freezing, the other two by lyophilization and vacuum storage. In these cases rupture occurred at intervals of five to 27 days after the original operation. In each case the homograft showed an inflammatory response with tissue necrosis and fragmentation of the elastica at the site of the rupture, but not elsewhere; in one case it was possible to demonstrate fungal hyphæ in the inflamed area. Senderoff *et alii* state that they believe that fatal graft rupture occurs more frequently than has been reported to date, and that in addition to the problem of early histological degeneration of the grafts, the problem of late degeneration is even more serious; results one or two years after operation have been excellent in most cases, but enough reports of late rupture have appeared to cause some concern. They conclude that the use of suitable plastic prostheses should be encouraged in preference to arterial homografts, and state that in their clinic plastic arterial prostheses are being used almost exclusively.

PULMONARY CONGESTION AND THE MECHANISM OF DYSPNŒA.

Pulmonary congestion is a simple enough concept, but the mechanisms involved in its production, its associated structural sequelæ and its functional implications are exceedingly complex. A useful and readable review of current knowledge has recently been published by G. M. Turino and A. P. Fishman[2] of the Department of Medicine, Columbia University, and the Cardiorespiratory Laboratory of the Presbyterian Hospital; the following summary of their paper is thus ultimately derived from some fifty papers to which the authors refer.

Pulmonary congestion implies pulmonary venous hypertension, pulmonary vascular engorgement and its sequelæ of interstitial and alveolar œdema, mural thickening in smaller vessels and perivascular fibrosis. These anatomical changes are accompanied by functional disturbances. The first of these is hyperventilation at rest; the subject breathes rapidly and shallowly, the relative increase in dead space requiring an increased minute volume. As the

[1] *Surg. Gynec. Obstet.*, 1950, 90: 568 (May).
[2] *A.M.A. Arch. Surg.*, 1959, 78: 67 (January).

[1] *A.M.A. Arch. Surg.*, 1959, 78: 364 (March).
[2] *J. chron. Dis.*, 1959, 9: 510.

arterial carbon dioxide tension tends to be low, in spite of some increase in the basal metabolic rate, there is real hyperventilation and not merely hyperpnœa. The vital capacity is usually, but not always, reduced, approximately in proportion to the severity of the congestion; the maximum breathing capacity may remain normal, but is immediately reduced when obstruction to airflow is produced by bronchial œdema or spasm or by œdema fluid in the airways. Pulmonary congestion is invariably associated with a fall in lung compliance—that is, higher intrapleural pressure "swings" are required to inflate or deflate the lungs by a given amount. Several factors are involved in this reduction, including the decreased air content and increased blood volume in the lungs, raised pulmonary blood pressure and perivascular fibrosis, but whatever mechanisms predominate in a given instance the effect is the same, namely, an increase in the mechanical work of breathing. The mechanical work of breathing is still further increased if, to the increased stiffness of the lungs, is added an increase in airway resistance as occurs with the development of "cardiac asthma" or frank pulmonary œdema. R. V. Christie, although not the first to suggest the relationship, was largely responsible for the concept that the resting breathing pattern, in normal as well as diseased subjects, was that combination of rate and depth which was most economical to the subject in terms of mechanical work. Patients with "stiff lungs" thus tend to breathe at a rapid rate with low tidal volumes; those with obstructed air passages breathe more slowly and deeply. In pulmonary congestion, as with other causes of low compliance, the work of breathing increases more rapidly than normal with successive increases in minute ventilation. The increased work is effected by means of increased work on the part of the respiratory muscles; this in turn leads to a highly significant increase in oxygen consumption and carbon dioxide production, and a point is ultimately reached at which further increase in ventilation is uneconomical in terms of the oxygen "cost" of producing it. This situation, in the presence of abnormal lungs, differs from the normal only in the much lower level of ventilation at which it occurs; inevitably, it places a limit on exercise capacity.

Other aspects of pulmonary function may be altered in pulmonary congestion, but in the absence of severe œdema or spasm it is notable that the gas tensions in the arterial blood may be little affected. Arterial oxygen saturation is kept close to normal, because on the one hand hyperventilation maintains a high alveolar oxygen tension, while on the other the oxygen tension of mixed venous blood in cardiac failure is low, so that a high alveolo-capillary oxygen gradient exists. Because of the hyperventilation, carbon dioxide tension in the arterial blood does not rise unless there is gross impairment of intrapulmonary gas mixing due to spasm or œdema.

Some of the foregoing considerations lead us a little nearer to an understanding of the factors involved in the production of dyspnœa, a distressing subjective sensation from the patient's point of view and a distressingly subjective one from that of the clinical scientist. It has been appreciated for many years that dyspnœa becomes marked when the minute ventilation reaches a certain proportion of the maximum breathing capacity. Although Turino and Fishman do not use this argument, Moran Campbell[1] indicates that it is more or less at this point that the accessory respiratory muscles are called into play (particularly as expiration becomes an active process) and the oxygen cost of breathing tends to become unrewardingly high. Malcolm McIlroy[2] has elaborated on this approach to produce an oxygen cost theory of dyspnœa, in which it is postulated that dyspnœa is a symptom of the development of an oxygen debt in the respiratory muscles, in a manner somewhat analogous to the production of angina or intermittent claudication. It is of course clear that when the mechanical work of ventilation is increased, either because of low compliance or high airway resistance, this endpoint is reached sooner than in healthy subjects. McIlroy examines the evidence for this theory in relation to a variety of disease states as well as normal subjects. The one situation to which the theory cannot apply is the dyspnœa associated with respiratory paralysis, for which a reflex stimulus originating in a relatively immobile chest wall is probably largely responsible.

It is perhaps a far cry from pulmonary congestion to emphysema, but it is pertinent to mention one of several provocative observations recently made by A. L. Barach,[1] who noted a lessening of dypnœa in emphysematous subjects, when, by various means, the activity of accessory muscles of respiration was reduced in favour of increased diaphragmatic breathing. A decrease in minute volume ensues without deleterious effect on blood gas levels, presumably because of increased ventilatory efficiency and diminished muscular activity. Is the physiotherapist at long last to be provided with an intelligent rationale for the use of her techniques?

[1] "The Respiratory Muscles and the Mechanics of Breathing", Lloyd-Luke, London, 1958.

[2] *Progr. cardiovasc. Dis.*, 1959, 1: 284.

REPEATED SNAKE BITE.

A CHARACTERISTIC of the Australian snake population is that a large proportion of the species commonly encountered are poisonous, and snake bite is a hazard of the Australian bush of which most Australians are very much aware. Some hardy individuals are even expert in catching poisonous snakes alive for the purposes of scientific study, or for zoos and similar institutions. The question whether those who have been bitten more than once acquire any degree of immunity is therefore one of more than theoretical interest. H. M. Parrish and C. B. Pollard[2] have studied the question in America on a series of 14 subjects who had been bitten more than once by poisonous snakes. Between them, these 14 individuals had experienced a total of 68 bites, all but three of them inflicted by one of the several species of North American pit vipers, a group which includes the rattlesnakes and moccasin snakes. Parrish and Pollard conclude that there was no evidence of any acquired immunity in these cases, and discuss why this should be so. That the failure to develop immunity was not due to the use of antivenene is shown by the fact that five of the patients, including one individual who had been bitten on 12 different occasions, had never received any antivenene, and others had received it on some occasions only. It is suggested that the failure to develop immunity may be due to the length of time elapsing between successive bites, and also to the fact that even in horses and dogs, in which immunity has been artificially induced for the production of antivenene or for experimental purposes, the protective titre of antibodies rapidly wanes after the cessation of venom injections. Another factor may be the short interval between the infliction of the bite and the onset of symptoms, giving little time for the stimulation of antibody production. In order to neutralize the venom, a high titre of antibodies must be present at the time of envenomation, or shortly afterwards. For these reasons Parrish and Pollard protest against the practice, resorted to in some cases, of transporting snake bite victims long distances to receive a blood transfusion from someone who has previously been bitten by a snake; such therapy would appear to be both useless and dangerous. Out of 13 patients tested, four were found to be allergic to the venom of the species of snake by which they had been bitten, some of them to the venom of other species as well. This suggests that in a proportion of persons who have once suffered a snake bite, if they are bitten again, the direct effects of the venom are likely to be complicated by venom allergy, and in such circumstances death may result from anaphylaxis rather than from the effect of the venom. In other cases, the danger to the victim depends solely on the amount and toxicity of the venom injected, and is unrelated to any previous experience of snake bite.

[1] *A.M.A. Arch. intern. Med.*, 1959, 103: 9.

[2] *Amer. J. med. Sci.*, 1959, 237: 277 (March).

Abstracts from Medical Literature.

OPHTHALMOLOGY.

Prophylactic Treatment of Retinal Detachment by Light Coagulation.

G. MEYER-SCHWICKERATH (*Trans. ophthal. Soc. U.K.*, 1956) discusses the early treatment, prophylactic treatment of degenerative areas, and the treatment of detachment caused by tumours and inflammatory diseases with light coagulation. The size of the area coagulated is regulated by a diaphragm, and the largest possible area coagulated covers an area of half a disk diameter. Errors of refraction in the patient's eye of more than five dioptres are corrected by a contact lens. Intensity, duration and wave-length of the radiation are so chosen that any undesired damage is impossible. Light coagulation leads to almost the same ophthalmoscopic picture as does diathermy coagulation, except for more subtle pigmentation during the healing process. Histologically, the picture is different, only the inner layers of the sclera showing signs of coagulation. The vitreous and its limiting membrane are not affected. Coagulation at the periphery of the fundus requires an exposure time of one second, while one-fifth of a second is sufficient for coagulation at the posterior pole. In order to achieve a chorio-retinal adhesion the distance between the retina and the choroid must not be more than about one to two dioptres. The isolated highly detached retina does not absorb enough light to become coagulated, and in such cases classical diathermy is necessary. The author describes the results of this therapy for macular holes, peripheral retinal tears, degenerative areas without holes, retinoblastoma, melanoma and angiomatosis retinæ.

Ocular Manifestations of Internal Carotid Artery Occlusion.

N. GORDON (*Brit. J. Ophthal.*, May, 1959) discusses the ocular signs of internal carotid artery occlusion and reports on 10 patients in whom ocular signs were present. The two commonest ocular symptoms are blindness of the homolateral eye and hemianopic field defects. The unilateral blindness may be transient or permanent. In the first case the patient complains of brief attacks of obscuration of vision affecting one eye, and soon afterwards hemiplegia appears. Homonymous hemianopia is the most frequent ocular sign of internal carotid artery thrombosis. It is usually permanent. The hemianopia is predominantly due to impaired circulation through the middle cerebral artery. Pupillary abnormalities and external ocular palsies occasionally occur.

Sudden Blindness in Cranial Arteritis.

G. PARSONS-SMITH (*Brit. J. Ophthal.*, April, 1959) describes the ocular signs of cranial arteritis. Eye complications occur in about half of the cases. In a number of cases eye symptoms, and not headache, first cause the patient to seek attention. When the blood supply to the eye is involved the attack is sudden and permanent blindness results. The author reviews 50 consecutive cases and describes 13 cases in which ACTH was used in treatment. These 13 patients presented in various ways, e.g., with retinal artery disease, retrobulbar neuritis or papill-œdema. When ACTH is commenced on the same day as the blindness is noted, vision has been restored. It is recommended that all occlusive incidents in the blood supply to the retina or optic nerve in elderly people who have no other evidence of ocular disease should be treated with a course of ACTH.

Ocular Changes in Phæochromocytoma.

S. R. GAINES (*Amer. J. Ophthal.*, April, 1959) makes a plea for recognition of the possibility of the presence of phæochromocytoma in hypertensive vascular disease and recommends that all patients with hypertensive vascular disease be screened by the "Regitine" test. The ocular changes in the malignant phase of hypertension cannot be distinguished from those which accompany phæochromocytoma. The author draws attention to the possibility of optic neuritis being a manifestation of phæochromocytoma and suggests that patients with optic neuritis should be investigated with the possibility of phæochromocytoma in mind.

Dacryocystorhinostomy.

S. MCPHERSON AND A. EGLESTON (*Amer. J. Ophthal.*, March, 1959) report on the result of dacryocystorhinostomy in 99 patients using the Duprey-Dutemps procedure. Operation was successful in 84 cases, and of seven second operations five were successful. Fifteen were unsuccessful. If success is to be achieved, there must be meticulous attention to detail, i.e., careful placement of the skin incision, atraumatic handling of soft tissues, a clean rhinostomy, careful suturing of mucous membrane flaps and careful dissection to expose the true lumen of the sac.

Progressive Myopia Treated with Vitamin E.

C. DESUSCLADE AND G. DESUSCLADE (*Presse méd.*, April 25, 1959), having examined a number of young people with myopia, state that they have found a number of different clinical abnormalities, some of which affect the connective tissue producing excessive laxity of ligaments. In view of the results obtained in disorders of connective tissue by treatment with vitamin E, in 1950 they tried it with success in progressive myopia. This observation led them to base the pathogenesis of the condition on relaxation of the collagen fibres of the sclerotic. In 1956 Garzino carried out anatomical and pathological studies with the electron microscope which confirmed this hypothesis. Under the influence of the intra-ocular tension and of various other physical factors acting on the eye, the ocular wall becomes distended; all the anatomical and pathological lesions of myopia can be explained by mechanical and trophic factors. Treatment with vitamin E arrests the progress of myopia. Its combination with other vitamins and some aminoacids seems promising. The authors stress the need for early diagnosis and treatment, and draw attention to the dangers of some forms of treatment—for example, the instillation of atropine, and the too early institution of eye exercises.

Glaucoma Control.

M. SLOAN (*Amer. J. Ophthal.*, May, 1959) discusses the early diagnosis of glaucoma. Routine tonometry should be performed on all patients over 40 years of age. Where tension is raised, gonioscopy should be practised to ascertain the patency of the angle. Two provocative tests may be necessary to further clarify the diagnosis. The two tests recommended are the water drinking test and mydriasis. The author considers that tonography should be carried out in certain cases and should be available as a routine procedure. Visual field studies are only of limited value in establishing diagnosis at an early stage. With regard to treatment, all patients with narrow-angle glaucoma should have peripheral iridectomy performed as soon as the diagnosis is established. The management of wide-angle glaucoma should be determined for each case individually.

Recurrent Erosion of the Cornea.

P. THYGESON (*Amer. J. Ophthal.*, May, 1959) analyses the ætiology and treatment of recurrent erosion of the cornea. The epithelium is torn loose from Bowman's membrane and hangs as an epithelial filament. The eye becomes red and painful. After a few hours the epithelium reforms and the eye becomes white and comfortable, only to relapse at some later date. The author reviews 32 cases, in 30 of which there was a history of trauma; in these 30 a common factor was extensive damage to the epithelium. The author has never seen this condition arising after the removal of a foreign body or after cauterization of the cornea in corneal ulceration. The first 20 patients were treated by chemical cauterization, and of these 12 were cured and eight relapsed. The last 12 patients were treated with the local application of steroids for a few days, and instillation of bland ointment at night. The author suggests steroids and bland ointment at night as a prophylactic measure in patients who suffer an injury which might be expected to be followed by recurrent erosion of the cornea.

Subretinal Fluid in Retinal Detachment.

A. SCHWARTZ (*Amer. J. Ophthal.*, May, 1959) discusses the methods employed to obtain drainage of subretinal fluid in retinal detachment surgery. In general it is usually safer and easier to drain at the point where most subretinal fluid is localized. Where simple diathermy has been used to cure the detachment, it is best to obtain drainage in the diathermy barrage or between the diathermy barrage and the ora serrata. If a scleral buckle has been performed, then drainage should be obtained in the bed of the buckle, or the operator should drain outside the buckle area, surrounding the drainage point with diathermy. The time for drainage is after placement of the diathermy in the case of retinopexy,

or after placement of the diathermy and passing of sutures in the case of scleral buckle. The author considers the advantages and dangers and describes the details of four techniques for obtaining drainage: multiple pins, sclerotomy or cut down, multiple perforations with electrode and punctum dilator.

Signs and Symptoms of Uveitis.

M. HOGAN *et alii* (*Amer. J. Ophthal.*, May, 1959) describe in detail the signs and symptoms of anterior and posterior uveitis and attempt to classify their findings. They deal first with anterior uveitis and discuss the occurrence of pain, photophobia, lachrymation, congestion, blurred vision, keratitis, keratic precipitates, flare, aqueous cells, anterior chamber angle, iris and lens precipitates, clot, iris nodules, hæmorrhage, hypopyon, iris atrophy, synechiæ, changes in the lens and intraocular pressure. In discussing posterior uveitis, the authors deal with vitreous opacities, vitreous detachment, macular œdema, optic nerve changes, chorio-retinitis, retinal detachment and perivasculitis.

Ocular Manifestations of Renal Insufficiency.

H. F. FALLS (*Arch. Ophthal.*, August, 1959) discusses the ocular manifestations of the chronic renal tubular insufficiency syndromes and describes the ocular pathology associated with Lowe's syndrome, pseudohypoparathyroidism and Fanconi's syndrome. In Lowe's syndrome the ocular manifestations are hydrophthalmos and congenital cataract; there may be blindness and nystagmus. In the pseudohypoparathyroid syndrome there are progressive juvenile or early adult cataracts; the affected person presents a peculiar physiognomy characterized by large round head, dull round facies and a short thick neck. Photophobia and the presence of cystine crystals in the cornea are the ocular features of Fanconi syndrome. The author describes these syndromes in detail.

OTO-RHINO-LARYNGOLOGY.

Primary Closure of the Radical Mastoidectomy Wound.

J. H. T. RAMBO (*Laryngoscope* (*St Louis*), July, 1958) suggests a method for the rapid healing of the radical mastoidectomy cavity. The simple mastoidectomy wound heals rapidly and completely. It is by primary healing. A radical mastoidectomy cavity can also be made to heal by primary intention, with all the advantages inherent in this kind of healing. Very little after-care is needed. The patient has no open cavity to suppurate or discharge. He may, for example, swim. This primary healing after radical mastoidectomy is accomplished by filling the meticulously cleaned-out cavity with a pedicle flap of the temporal muscle whose abundant blood supply keeps it viable. Skin flaps are prepared from the anterior and posterior canal walls. These are laid on the muscle. Complete healing results. It must be noted that in cases where maximum hearing is desired, this method is not applicable. It is applicable where the bone conduction is already well down, where the other ear is good, and where more elaborate procedures are not deemed advisable.

Pharyngo-Œsophageal Prosthesis.

T. A. CLARKE (*J. Laryng.*, April, 1959) describes the use of a pharyngo-œsophageal prosthesis in the case of a patient with a large pharyngostome due to post-operative wound breakdown. The tube used was the Shaw and Ormerod modification of the Negus tube, designed for temporary wear to carry to a Thiersch graft. In this case it was worn for a long period of time, sealing the salivary leak and permitting normal taking of food. The patient had undergone laryngectomy after radiation. The wound breakdown had been treated unsuccessfully by plastic surgery. The tube reaches from the base of the tongue to just above the thoracic inlet, and in the first instance was worn without change for six months. The tube was then changed and worn for four months, at which time another change was made. The patient's general well-being improved and his weight increased.

Operability in Laryngeal Cancer.

J. L. KEEFE (*Ann. Otol.* (*St. Louis*), June, 1959), discussing the criteria of operability in laryngeal cancer, states that the selection of the operation to be performed should be governed by an appraisal of the patient and of his tumour. Failures are due to inadequacy of the primary operation. Usually, after operations less than laryngectomy, local recurrence is the first sign of failure, whereas after laryngectomy recurrence is manifested in glandular metastases. The author discusses cases from Jefferson Hospital, Philadelphia. Cordal cancer, contained on the membranous portion of one cord, is treated by laryngofissure, with 95% success. When extension of this operation was used for cancer which had extended anteriorly, failures rose to 21%; when partial laryngectomy was performed for posterior or subglottic spread with a mobile cord, the failure rate was 82%. Laryngectomy without gland dissection, for patients without palpable glands, gave a 24% failure rate, whilst with gland dissection the failure rate was 13%. Figures for extracordal cancer, for which laryngectomy plus neck dissection was carried out, revealed a failure rate of 37·5% when glands were palpable and 12·5% when glands were not palpable before operation. The author comments that, as the disease will cause the death of the host, the more radical measures cannot be held in reserve; though a certain amount of unnecessary surgery in terms of gland dissection may be carried out, little or no extra morbidity or mortality would result from this.

Endaural Tympanic Approach to the Facial Nerve.

O. H. MEURMAN (*Acta oto-laryng.* (*Stockh.*), November-December, 1958) reports three cases of facial paralysis in which he operated on the patient. He used an endaural tympanic approach to the facial nerve, which is the same as that used normally for stapes mobilization operations at his clinic. A circular endaural incision is made near the external opening of the external auditory meatus. This is made from twelve o'clock, swinging around the back wall to six o'clock. Another incision is then carried from the origin of the twelve o'clock point upward between the tragus and the helix for some distance to the front of the helix. The bony covering of the mastoid process is then exposed. The skin of the meatal wall is then carefully separated from the bone down to the tympanic sulcus. The drum is then elevated and turned medially with the skin exposing the tympanum. By means of burr and gauge as much of the lateral tympanic wall as necessary is removed to get a good view of the oval window area and the facial canal above and behind it. The canal of the facial nerve is then followed to the posterior meatal wall and the nerve exposed to the stylomastoid foramen. The mastoid cell system is not opened. Tympanic membrane and meatal skin are replaced and the wound is closed. The author claims three advantages for this method: (i) The nerve can be easily found because a direct view is obtained of the area where the nerve canal enters the external meatal wall. (ii) Injury can be avoided to the ossicular chain and its function can be checked. (iii) Prolonged after-care is obviated, and it is not necessary to open the mastoid cell system.

Phenylbutazone in the Treatment of Œdema of the Ear, Nose and Throat.

M. LINEBECK (*Laryngoscope* (*St. Louis*), January, 1959) discusses the use of phenylbutazone ("Butazolidin") to decrease the œdema associated with otitis externa, or in the nose associated with furuncles or after operations. Œdema associated with allergy and angioneurotic œdema are not considered. Patients with a history of anæmia, allergy or peptic ulceration are excluded. The dose recommended is 600 to 800 mg., taken on a full stomach, the first day and 400 mg. on the next two days. If necessary, this dose can be continued for a further three or four days. Salt intake is restricted. Only two cases of gastric upset were noted in the series of 77 patients. The author states that the œdema settled much more quickly than in other patients who were treated with the same measures, but excluding phenylbutazone.

Systemic Hæmostatic Drugs in Tonsillectomy.

S. THAJEB, M. KURKCUOGLU AND A. E. MCELFRESH (*A.M.A. Arch. Otolaryng.*, July, 1959) describe the results of a "double blind" trial of agents used to increase coagulation during tonsillectomy and adenoidectomy. They used: (i) a combination of oxalic and malonic acids ("Koagamin"), (ii) adrenochrome monosemicarbazide ("Adrenosem"), (iii) intravenously administered œstrogens ("Premarin"). Each was used on a series of patients with a parallel control series of patients who were given placebos. The surgeon was unaware of what the patient had actually received. Evaluation of blood loss was by the surgeon. The authors state that any one of these drugs tested may be of benefit in patients with a hæmorrhagic diathesis. However, in the tests carried out, none of these drugs seemed to have any objective effect on the amount of bleeding during operation.

British Medical Association.

NEW SOUTH WALES BRANCH: SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on April 30, 1959, at the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney, DR. M. S. ALEXANDER, the President, in the chair.

Staphylococcal Infection in Infancy.

DR. CLAIR ISBISTER read a paper entitled "Staphylococcal Infection in Infancy" (see page 629).

DR. PHYLLIS M. ROUNTREE read a paper entitled "Staphylococcal Infection in Infancy".

She said that many strains of staphylococci could cause infection in the newborn infant, and pemphigus neonatorum, with or without serious clinical manifestations, had been known for many years. However, the problem of the treatment and prevention of those diseases had been posed more acutely in recent years by the occurrence of infections in epidemic form in hospital nurseries, not only in Australia, but throughout those countries of advanced civilization where mothers had their babies in hospital. That had been due chiefly to the appearance since 1953 of strains which seemed to be capable of causing skin lesions more readily than earlier strains, not only in infants, but also in adults, and which were almost universally penicillin-resistant. Phage typing had shown that most of those strains were closely related, and they were commonly known as type 80 strains. They had caused most of the neonatal outbreaks in Australia in recent years. Those neonatal infections had led to the dissemination of the strains far and wide in the general population. The baby brought his staphylococci home from the hospital, and infections could spread to the mother, to older children and to other members of the household. In many families, the occurrence of boils, carbuncles and abscesses could be traced back to the introduction of a new baby into the home. It was estimated that 48% of all staphylococcal lesions seen in general practice originated in that way. Those hospital and home infections were also reflected in the types of staphylococci isolated from children admitted to hospital with serious staphylococcal disease. Of 66 children in children's hospitals in Sydney in 1956-1957, 68% were infected with type 80 and related strains. In a recent survey throughout Australia it had been found that 33% of children aged under five years with minor staphylococcal lesions of the skin and subcutaneous tissues seen by doctors in general practice were infected with type 80 strains, in contrast to the higher incidence of those strains in more serious infections. The antibiotic resistance of the infecting organisms will often depend on the incidence of resistant strains in the hospital from which the infection came. Penicillin resistance was almost universal, but resistance to other substances varied from place to place. It was therefore important that the organism be isolated and its antibiotic sensitivities determined and used as a guide to appropriate therapy.

Dr. Rountree went on to say that, as with all infectious diseases, before infection could be prevented it was essential to know how it was transmitted. That an adult suffering from staphylococcal lesions or carrying the epidemic strain in the anterior nares without any history of recent lesions could be a source of infection to the newborn had been recognized for some time, and it was logical to prevent contact between such infected adults and the newborn baby. Only recently it had been shown that perineal carriage of staphylococci could occur in the absence of nasal carriage. In certain selected groups of students and patients in two London hospitals, approximately 20% of those studied were found to be perineal carriers of that kind. The clothing of those people might be heavily contaminated with staphylococci. No investigation of perineal carriage had been made in Australia.

The newly-born baby in a hospital nursery was immediately exposed to the staphylococci of the environment. The ultimate source of those organisms was always another human host, but they might be transmitted in various ways. Direct contact with the subclinically infected carrier among the nursing and medical staff was one important means. Indirect transmission from baby to baby via the nursery air or fomites might also occur. The studies carried out at King George V Hospital had indicated that the nursing staff was the most important source of infection; but occasionally infections had occurred when the nursery dust was contaminated with staphylococci and no adult carriers had been found.

Dr. Rountree then said that the anterior nares of the baby were rapidly colonized by one or more of the strains of staphylococci in his environment, and those organisms could be grown in enormous numbers from nasal swabs of approximately 90% of babies at the end of the first week of life. Isbister and Coventry had also shown that the umbilicus was frequently colonized. More detailed studies of those colonizations by Gillespie and his co-workers in Bristol indicated that the umbilicus was colonized first, and that nasal colonization occurred later. By the tenth day of life with the drying-up of the umbilical stump, the rate of umbilical carriage had fallen. It was generally assumed that the colonized babies could release large numbers of organisms onto their clothing and bedding and thence to the nursery air and dust, and that they could act as reservoirs of infection for further babies as they entered the nurseries. With the introduction of an epidemic strain, likely to cause lesions as well as to colonize, it was easy to see how it might rapidly spread and infect a large proportion of the babies at risk. With those facts in mind, various methods of control had been tried, with varying degrees of success.

Masking and gowning of the staff looking after the babies had its advocates. There were many difficulties in the proper use of masks and gowns, not least of which were the costs. Forfare and MacCabe in Edinburgh had calculated that it costs £stg.630 *per annum* to provide sufficient masks and gowns for the staff of a 45-bed nursery. In many hospitals, masks and gowns had been abandoned and other methods of control substituted.

Attempts must be made to detect and treat nasal carriers of epidemic strains of staphylococci. In addition, there should be strict rules concerning the reporting by the staff of any staphylococcal lesions; that should include not only the nursing staff, but also pædiatricians and resident medical officers. To carry out such supervision of the staff required a large amount of laboratory work and ready access to facilities for phage typing. Experience at King George V Hospital in the past four years had taught something of the difficulties of reliance on such a policy. In spite of constant vigilance, the over-all infection rate in 1957 was 4·4%. Infections with type 80 staphylococci first appeared in 1956, and they had been a problem from then on, although they accounted for only a proportion of all the infections. It had to be noted that that strain was now so widespread in the general population that it was being constantly reintroduced into hospitals. Not all hospitals were able to carry out the extensive investigations required for such close bacteriological control of their staff. In the event of serious epidemics, of course, careful bacteriological studies of babies, staff and nursery environment were indicated, and the State health departments were able to provide assistance in that respect.

Another method of control was based on the concept of a chemical barrier between the baby and the staphylococci of his environment. Various ways of arranging that chemical barrier had been studied. In some hospitals, acting on the proposition that it was the hands of the nurses that conveyed infection to the babies, hand creams containing chlorhexidine ("Hibitane") had been introduced for nurses to use after washing. The results had been only partially successful in carefully controlled studies. Another chemical which showed more promising results was hexachlorophene. It might be used to build up bacteriostatic barriers, either on the baby's skin or on the hands of the nursing staff or on both. The first reported use of that substance had come from Canada in 1952, where its use in a lotion for bathing babies reduced the incidence of lesions in a hospital in Toronto from 6·5% to 0·63%. Studies of 3% hexachlorophene solution as a bath for babies in Columbus, Ohio, showed that its use reduced the colonization of the babies noses to 30%, compared with 100% in babies receiving dry care. Gillespie in Bristol had applied it to the babies' skin in a powder, and had reduced colonization of the umbilicus, groin and perineum to a very low level. Nasal colonization occurred in approximately 50% of the babies' noses in one nursery where the powder was used, in contrast to 80% where it was not used. The detailed incidence of actual lesions in the babies in the Bristol study had not yet been reported fully, but it was stated to have been significantly reduced.

Hexachlorophene, both for bathing the babies and as a hand scrub, was introduced into King George V Hospital in May, 1958. The infection rate fell from the high level of 10% in the first four months of 1958 to 3% in May-August, and further to 1·4% in September-December, while in the first three months of 1959 there was a singular

absence of infections, the rate being 0·8%. No studies had yet been made on the nasal colonization rates in babies submitted to that régime, but it was planned to carry them out shortly. The babies were bathed with a hexachlorophene-containing lotion which was lathered on their skin. That bathing was done every second day. In addition, nurses coming on duty did a surgical scrub with the lotion. So far the results had been satisfactory. No serious complaints had been made by the nursing staff, and any infections in the infants in the past few months had been minor ones.

Dr. Rountree said that one should not be over-optimistic about the future, and more work was needed before it could be understood just what they had been doing to the staphylococci of the infants' environment. For example, it was not yet known what happened to the infants after they left hospital. If nasal colonization with epidemic strains had taken place, then infections might be occurring after the chemical barrier had been lowered. It would perhaps be logical to recommend the continued use of hexachlorophene lotions or soaps for the baby's bath in his own home, but many families might find the cost too high.

Summarizing her paper, Dr. Rountree said that staphylococcal infection in infancy was largely a product of the modern obstetrical practice of congregating large numbers of babies in hospital nurseries. Infection acquired in hospitals accounted for a large amount of the staphylococcal disease of infants. Various physical and chemical methods had been used to prevent those infections, and the most promising at the present time appeared to be those that were based on the building up of bacteriostatic barriers on the infant's skin. However, those methods must always be accompanied by good housekeeping and the careful control of infections in the hospital staff, with the exclusion from a nursery of anyone suffering from lesions. Finally, it was pertinent to emphasize that staphylococcal disease was an infectious disease and should be nursed accordingly.

DR. L. A. M. B. MUSSO asked Dr. Rountree what was the procedure adopted when hexachlorophene was used as a barrier.

DR. H. G. WALLACE asked whether anyone had investigated the infection rate of the mothers. He wondered whether it was possible that the mothers picked up severe staphylococcal infections in hospital, and passed them on to their children later.

DR. STEPHEN FISHER said that there was another aspect of the problem in addition to the bacteriological and epidemiological aspects—the immunological aspect. To grow the staphylococcus in culture took 24 hours. However, in some staphylococcal infections in the acute stages, it might be possible to detect specific bacterial products. Referring to treatment, Dr. Fisher said that staphylococcal antitoxin had gone out of fashion; but in every type of experimental staphylococcal disease that he know of, stapyhlococcal antitoxin worked. He thought that there was a place for it in fulminating disease—it might save lives. He thought that one reason why it was not used was its best known component had been shown not to be the chief protective factor. Commercial antitoxin contained a considerable number of factors.

DR. GRACE CUTHBERT-BROWNE said that she wished to give some facts concerning the last six months, the period during which compulsory notification had been in operation. Dr. Cuthbert-Browne said that of 78,000 births, only about 400 had taken place in private homes. That was largely the result of the lack of domestic help for the mothers in Australia, and the fact that the nurse could attend to her obstetric duties only; thus there was no way in which confinements could return to the home. The question of rooming-in would have to be investigated by each hospital, to see what could be done. The wishes of the mother would have to be consulted—whether she wanted total or partial rooming-in, or did not want it at all. Rooming-in was one of the barriers against human contact which would have to be looked into. Another point was that in New South Wales, 90% of all births took place in the public maternity hospitals, and the remainder in private hospitals. Dr. Rountree had mentioned that it was not always known what happened to patients when they went home; Dr. Cuthbert-Browne said that since notification had been introduced six months previously, over 500 breast abscesses had not been notified, and over 100 of those mothers had been confined in teaching hospitals. Also, there were 22 public maternity hospitals in the metropolitan area, and only three had notified staphylococcal infections. The failure of hospitals to notify those infections was serious. Dr. Cuthbert-Browne said that, because of the large number of breast abscesses not notified, she had discussed the position with some of the major obstetric hospitals. Five of them had agreed to carry out an identical system of recording for a limited time, to decide what clinical manifestations should be notifiable. By that cooperation between the Department and the obstetric hospitals, it was thought that it would be possible to advise other hospitals on the simplest and most efficient method of making out their notifications and recording infections.

Dr. Cuthbert-Browne said that for six years the Department had offered to assist maternity hospitals wherever staphylococcal infection was known to have occurred. The members of the staff of the Division of Maternal and Baby Welfare were experienced in helping hospitals to assess their own problems, and certainly had the latest information concerning control and treatment; any such contact had been welcomed. The Department was thus in a position to advise the Hospitals Commission as to the need for structural alterations and other requirements involving finance. The Department made available a booklet dealing with staphylococcal infections, now in its fourth edition. It would be seen from the acknowledgements how many people had assisted and advised in the production of that edition. Dr. Cuthbert-Browne said that she had been very disappointed with the failure of the hospitals to notify staphylococcal infections over the last six months.

Dr. Clair Isbister asked Dr. Rountree a question about the percentage incidence of staphylococcal infections quoted at the King George V Hospital; she wondered if they were all confirmed pathologically, or whether the diagnosis was made on clinical grounds only. She also asked how often "pHisoHex" baths were carried out there.

DR. E. S. STUCKEY said that, as a surgeon, he was concerned with the importance of osteomyelitis. It was increasing in frequency, and was likely to be contracted in a maternity hospital. It had an insidious onset, the baby did not appear ill, and the clinical picture failed to call attention to the type of disease.

DR. ALEXANDER referred to the question of circumcision in hospitals. He said that at one hospital with which he was associated, a ban was placed on the performance of circumcision, and six months later the ban was lifted. He asked Dr. Rountree if she could say under what circumstances a ban should be imposed or lifted.

DR. G. M. B. HALES said that he objected strongly to the use of the words "necessary operation" in relation to circumcision. He thought that the procedure should be banned, at least in obstetric hospitals. A migrant patient of his had actually thought that it was compulsory for all babies before they left hospital.

Dr. Rountree, in reply to the question about hexachlorophene baths, said that the babies were bathed in hexachlorophene solution every second day; the material was lathered on to them. The nurses also used it as a surgical scrub-up on going on duty in the nurseries, and if they left for any reason, they repeated the scrub-up on returning. In the hospital in Toronto, Canada, in which it had first been used, on one occasion a three-day interval was left between baths, and immediately the infections began again. There seemed no doubt that a bacteriostatic barrier was ultimately built up on the surface of the skin. The material might also act mechanically, by removing infected vernix caseosa before it dried and flew about in the air. In reply to the question about infections reported from the King George V Hospital, Dr. Rountree said that they had all been clinical infections confirmed bacteriologically. That had been done, as far as possible, with every lesion that had occurred there since 1952. In reply to Dr. Wallace's remarks about the mothers' noses as sources of infection, Dr. Rountree said that studies carried out some years earlier had shown that mothers in hospital were rarely sources of infection of babies, who acquired their infections from the nursery environment. However, there was the possibility that if an epidemic strain of staphylococcus was widespread in the hospital environment, the mothers might also become carriers of that strain and take it home too. However, the chances were that it was nearly always the baby who became infected first. Whereas 90% to 100% of unprotected babies became carriers of staphylococci in their noses at the end of one week of life, in adults the carrier rate was under 45% under normal conditions. That kind of infection could be traced in mothers who developed breast abscesses; the strain in the lesion was different from their own nasal strains, but the same as that in the baby. Dr. Cuthbert-Browne had mentioned rooming-in. Dr. Rountree said that she herself had not referred to it, because there were insufficient data on the subject. There had recently been

a paper on it in The Medical Journal of Australia, written by a social worker; the infection rates were not gone into in detail, but they were very high. Nearly all the babies did go into the nurseries at night and when there were visitors at the hospital. The report had not been a good study of the effect of rooming-in on infection in babies; a proper study would have to be made more strictly.

Dr. Isbister, in reply to Dr. Fisher's remarks about antitoxin, said that she thought it should be used. She herself had not recently had a really severely infected baby in her care, except the one who had died. In the next similar case she would use antitoxin. In reply to Dr. Stuckey's remarks about osteomyelitis, Dr. Isbister said that the limiting period of four weeks for notification made things difficult. In her experience, infection manifested itself in babies between four and eight weeks. She had not seen many cases of osteomyelitis occurring in that way. That would be one infection that would still not be notifiable. Referring to circumcision, Dr. Isbister said that at the Royal North Shore Hospital it was the practice that public hospital patients could not be circumcised in hospital. In her opinion, if the baby had a staphylococcus in the nose and umbilicus that was coagulase-positive, it was often strain 80, and often pustules were present on the thighs after circumcision. When those conditions operated they could cause the death of the baby. Out of nine babies in her series who developed staphylococcal pneumonia, three had died. Five of the seven boys had been circumcised; no history was obtained for the other two. Dr. Isbister could not see how any surgeon could possibly perform a non-essential operation when those virulent organisms were in the patient's nose and umbilicus. She was sure that was why those babies had died—their resistance was temporarily lowered by operation. Any mother who wanted her baby circumcised could bring him back later. In the normal infant at birth the foreskin could not be retracted; it was much easier to do so after six months. In most cases circumcision was a non-essential operation, in some it was desirable; but in none should it be performed under four weeks. In reply to Dr. Cuthbert-Browne's remarks about the lack of cooperation in notifying infections, Dr. Isbister said that it was a major problem to know just what were the infections caused by the staphylococcus in the first four weeks. The practice at the Royal North Shore Hospital since September, 1958, had been to have cultures prepared in likely cases. The obstetric and pædiatric staff had agreed to notify all clinical staphylococcal infections proved by culture; but it had been difficult to find out if notifications were to be based on clinical or pathological grounds. Dr. Isbister finally said that she hoped notification would not mean fumigation of the patient's home.

Dr. Alexander, from the chair, said that the evening had been interesting and instructive. On glancing through the National Health and Medical Research Council's booklet on staphylococcal infections, he had been struck by the following words:

> It is of the first importance that all members of the staff, professional and lay, appreciate the importance of the staphylococcus as an agent of mortality in the nursery, and continue at all times alert to their personal obligations in the concerted measures of control.

Dr. Alexander said that the meeting had had ample proof of that necessity, and all present were much indebted to two speakers for their papers.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

QUARANTINE.[1]

[From the *Australasian Medical Gazette*, June, 1884.]

The chief disease against which quarantine has hitherto been levelled, undoubtedly has been smallpox, and on its becoming epidemic in Sydney in 1881, the whole of the Australian Colonies were thown into a state of uneasiness, which our visitors from other countries where it is endemic could hardly understand. Many of our critics smiled at the solicitude with which we endeavoured to stamp it out by means of an application of our quarantine system: but we succeeded, although at the cost of much heartburning and the expenditure of a large sum of money. And perhaps harsh criticism may be somewhat disowned when it is known that, in what is on the whole an exceedingly ineffectively vaccinated population of nearly 3 millions of people, we have hitherto practically secured an immunity from that disease, although it has times without number been brought to the colonies: and on board vessels arriving at the port of Sydney alone, it has occurred no fewer than 46 times during the last thirty years, and in forty four instances it has been kept out of the colony by means of a vigilant quarantine. Thus circumstance seems to us to afford us reasonable ground on which to base our system, and the fact recorded in the British Medical Journal of 3rd May last, that on the 24th April there were under treatment in London hospitals no fewer than 450 patients suffering from smallpox, leads us to entertain very grave doubts as to abandoning quarantine for that disease, even if our population were as thoroughly vaccinated, as that in the mother country.

[1] From the original in the Mitchell Library, Sydney.

Correspondence.

DRUG HOUSE REPRESENTATIVES.

Sir: It has been the custom of my partner and myself to give appointments to drug-house detailers, so that they might have an uninterrupted opportunity to present their case. During the last four months we have had a total of 14 such appointments, of which only four have been kept. In only one case did the representative apologize subsequently for his absence. We made these experiences known informally some six weeks ago to senior members of the Medical Representatives Organization, but have not noted any change in the trend.

We have hesitated to ventilate the matter directly with the management of the drug houses concerned, and would therefore appreciate publication, firstly because it seems unlikely that the management of the drug houses concerned are aware of these happenings, and secondly, because it seems possible that we are not alone in our experience.

Yours, etc.,

James Molesworth.

"Beanbah",
235 Macquarie Street,
Sydney.
October 9, 1959.

ESPERANTO OR INTERLINGUA?

Sir: In The Medical Journal of Australia of March 10, 1956, under the heading "Esperanto or Interlingua?", appeared an article in which the relative merits of these two languages were put forward. Reference was made to articles by Dr. Pierre Berlot and Dr. A. Plichet, supporters of the respective languages, and some summary of their findings was given, from which it appeared that Esperanto was more capable of meeting the needs of the modern world.

My attention was drawn to the article at the time, but unfortunately I was not then free to enter into correspondence about the matter. The subject, however, is one of more than passing interest, as I feel that never before has the need for an international language been so acute as it is today, and, as an active Esperantist, I can add some interesting information concerning the practical use being made of Esperanto in the field of medicine already.

How many know that there is in existence an International Medical Esperanto Association which publishes its own journal in Esperanto, or that there exists an International Scientific Association with its own scientific journal published regularly in Esperanto? Besides this, many books on a variety of scientific subjects have been published in Esperanto, and many articles have been published in medical journals in the national language with résumés in Esperanto, particularly in Japan. From time to time, too, international

medical congresses have been held at which the only language used was Esperanto. Of this I have had personal experience, and can speak with enthusiasm of the ease with which the language fulfils this purpose.

By attending such congresses, by travel in many countries and by international correspondence, I have proved again and again the great practical value of Esperanto for all purposes. Esperanto is the key that will open the door to vital information in all languages, not just one, as would be the case if time were spent on learning one of the national languages; and the time required to master Esperanto is but a fraction of that necessary to acquire the barest working knowledge of any one of the national languages.

In planning to learn a language, when time is limited, why spend it lavishly on trying to acquire a national language? In choosing an international language, why choose a language that is outmoded from its inception or, to say the best of it, restricted in its vocabulary and unable to satisfy every modern requirement? Why not choose Esperanto, the language that has stood the test of more than 70 years of practical use in every field of activity; the language that has the greatest following; the language that has achieved some official recognition, when, at the recent Unesco Conference at Monte Video, the right of consultative status with Unesco was conferred on the Universal Esperanto Association, the central organization to which the national Esperanto Associations are linked?

I shall be happy to supply further information about Esperanto to anyone who cares to write to me.

Yours, etc.,

FRED WILLIAMS,
President,
Australian Esperanto Association.

392 Albert Street,
East Melbourne,
Victoria.
Undated.

REPORT OF A CASE OF DIFFUSE INTERSTITIAL FIBROSIS OF THE LUNGS (HAMMAN-RICH SYNDROME) SUCCESSFULLY CONTROLLED BY PREDNISOLONE.

SIR: My attention was recently drawn to a letter by Dr. J. Read and Dr. H. Colebatch (MED. J. AUST., August 22) regarding the pulmonary function data in a case report by Dr. Noel Bennett (MED. J. AUST., July 18) of the Hamman-Rich syndrome. I am grateful for the observations made in their letter, as I was responsible for the interpretation to which they take exception, and equally respectfully would like to reply.

1. Nowhere in Dr. Bennett's report was the improvement —maximum breath capacity (M.B.C.)—ascribed to clearing of the lung lesion. The improvement was noted and measured and no explanation offered. It is true the low M.B.C. may have been due to "significant airway disease", if by this is meant airway obstruction; but I find it difficult to explain the low inspiratory capacity, the expiratory volume and vital capacity, unless a restrictive lesion was present. However, "airway disease" may imply a concept with which I am not familiar.

2. I humbly apologize for referring to "compliance of lungs and thorax". It should, of course, refer to lung compliance alone, as Dr. Read and Dr. Colebatch rightly point out. Unfortunately, I was not shown the proofs and could not correct this and another error which appeared. Nevertheless, we have taken normal compliance values to fall within the range of 0·15 to 0·25, and our own normals are certainly above the mean quoted in Dr. Bennett's of 0·11. I am aware of the truth of Dr. Read and Dr. Colebatch's observation that the progressive drop in compliance after treatment merely implies differing time constants through the lungs. In fact, it may indicate regression of the lesion from a uniform fibrosis to a patchy lesion, equally, as they imply, as progression.

3. It is most doubtful whether any significance should be attached to the minute volume figures. On the second occasion we had trouble in getting the patient to respire quietly. She was three months pregnant and most anxious to demonstrate her improvement on the spirometer.

4. My apologies again—the figure for the arterial oxygen saturation should be 97% not 91%. I agree entirely with the conclusions of Dr. Read and Dr. Colebatch on the quoted figure of 91%.

Dr. Read and Dr. Colebatch say: "There is no doubt that Dr. Bennett has greatly benefited his patient clinically by the use of steroids, but certainly not for the reasons offered." May I ask where and what are the "reasons offered"? My sole comment in the original report was that the pulmonary function tests were insufficient to demonstrate an alveolar-capillary block, but they did demonstrate the marked improvement in ventilation occurring after treatment. That statement still stands, and more was not offered or implied by Dr. Bennett or myself.

Yours, etc.,

MALCOLM ALLEN.

Alfred Hospital,
Melbourne.
October 8, 1959.

TETANUS PROPHYLAXIS.

SIR: At least six articles or letters have appeared in the Journal this year on the subject of tetanus prophylaxis by means of tetanus antitoxin.

Ackland[1] advocates its use, and provides an elaborate ritual in the giving, to overcome the danger of administration, while a special article[2] from the staff of the Commonwealth Serum Laboratories states that passive immunity may be obtained by its use; but neither offers any evidence to suggest that tentanus antitoxin is effective in preventing the occurrence of tetanus in humans.

Cordner[3] claims that the ritual of Ackland is too time-consuming for general practice, and suggests that a blind eye be turned to the danger, whilst Taylor[4] attempts to talk the patient out of having the injection.

Hunter[5] presents a brief summary of the literature, demonstrating the danger and uselessness of the prophylactic use of the serum, and finally a perplexed practitioner, O'Halloran,[6] asks for an authoritative statement.

I have watched this Journal in vain for such a statement, and while not claiming any authority, I had occasion a few years ago to review a great bulk of literature in the English language, and some selected German translations on the subject.

No evidence was found by me to suggest that tetanus antiserum had any value as a prophylactic agent against the development of tetanus following accidental trauma to humans. If any persons, or the manufacturers of this dangerous material, have evidence to the contrary, the time is ripe to present that evidence for evaluation.

In the absence of such evidence, tetanus antitoxin should be classed as both dangerous and useless, and its continued manufacture and prescribing as a Pharmaceutical Benefit for the purpose of prophylaxis against tetanus in humans, a waste of public money.

Yours, etc.,

K. D. MURRAY.

22 Mahar Street,
Kensington Gardens,
South Australia.
September 23, 1959.

ELECTIONS TO THE UNIVERSITY OF SYDNEY SENATE AND THE N.S.W. BRANCH COUNCIL.

SIR: The "Monthly Bulletin" of the British Medical Association (N.S.W. Branch) for September has in its "Memoranda to Members" an unsigned article dealing with the University of Sydney Senate Elections. It refers to a "debacle" at the last elections, when only one medical graduate was elected, and blames this, amongst other reasons, on the fact that 12 medical graduates contested 10 vacancies.

Surely there are few members of the B.M.A. who feel an M.B., B.S. is by itself an outstanding qualification for the senate. Does the editor of the "Bulletin" advocate a pre-selection ballot?

Having finally roused myself to writing a letter, may I tackle a further problem associated with elections both to

[1] MED. J. AUST., 1959, 1: 185 (February 7).
[2] MED. J. AUST., 1959, 1: 210 (February 7).
[3] MED. J. AUST., 1959, 1: 444 (March 28).
[4] MED. J. AUST., 1959, 1: 545 (April 18).
[5] MED. J. AUST., 1959, 2: 98 (July 18).
[6] MED. J. AUST., 1959, 2: 298 (August 29).

the University Senate and B.M.A. Council? Both of these institutions are still conducting their elections on the basis of a small compact electorate. When the method of election for both bodies was originally decided on, it was probable that the majority of candidates were personally known to the electors. This is obviously no longer true, and we now frequently have to vote for people who are practically unknown to us personally, and whose policies are also unknown. A large proportion of the votes must therefore be cast for fairly irrational reasons, and our representatives are no longer necessarily "representative".

My own solution would be to encourage candidates to state their views on the likely contentious issues—e.g., the universities' and the professions' relations with governments. At present it is considered "unethical" for candidates to state more than a list of degrees, decorations and positions held, usually all rather meaningless.

Yours, etc.,

R. KLUGMAN.

37 Station Street,
Guildford, N.S.W.
October 3, 1959.

MALIGNANT MELANOMA.

SIR: Dr. John C. Belisario has very kindly pointed out to me an error in my paper "Malignant Melanoma" (MED. J. AUST., September 26, 1959) which may lead to some confusion.

I have stated that malignant melanoma is one of the most common cancers afflicting Australians, whereas one should have said that Australians are more commonly afflicted by malignant melanoma due to a combination of our climate and ethnic origin. The actual incidence of malignant melanoma in comparison with other cancers is well down the list.

Yours, etc.,

R. I. MITCHELL.

The Royal North Shore Hospital of Sydney,
Crow's Nest, N.S.W.
October 9, 1959.

NEURO-PSYCHIATRIC COMPLICATIONS OF MECAMYLAMINE THERAPY.

SIR: In view of the recent paper by Dr. Murphy and Dr. Sutherland[1] describing a case of neuro-psychiatric complications of mecamylamine therapy, and the subsequent letter on this subject by Dr. A. E. Doyle,[2] it may be of interest to record a further case.

Mr. A. first attended the hypertensive clinic of the Clinical Research Unit of the Alfred Hospital in 1951, at the age of 38 years, when he was found to have malignant hypertension. He was treated with various ganglion-blocking agents, supplemented at first with hydralazine and subsequently with reserpine. His requirements of oral pentolinium were high (1200 mg. per day), and in October, 1957, mecamylamine was substituted. Chlorothiazide was added in December, 1957. In June, 1958, the dose of mecamylamine was increased from 50 mg. daily to 60 mg. daily, and he then developed a coarse, rapid tremor, so that he was unable to lift a cup of tea, and he also experienced marked "twitching" of his limbs at night; in general, however, he felt perfectly well, and there were no psychiatric effects. All tendon reflexes were very brisk; plantar responses were flexor. After observation for a week, during which time there was no change in his condition, mecamylamine was stopped, and pentolinium was given instead. Within a few days, the nocturnal twitching ceased and the tremor became much less marked, disappearing entirely within two to three weeks.

This patient had had no symptoms or signs of cerebrovascular disease. On the other hand, his renal function was poor, and his blood urea was 100 to 110 mg. per 100 ml. at the time of this episode. Several of the cases reported by Schneckloth *et alii*[3] had high blood urea values.

Since this episode, his drug régime has again been changed because of the difficulty of maintaining satisfactory control of his blood pressure with pentolinium. He is now taking pempidine, 30 mg. daily, and this has not caused any untoward effects.

This case, which resembles in many ways that of Dr. Murphy and Dr. Sutherland, again illustrates that neurological complications of mecamylamine therapy may occur in a patient who does not give a history of cerebro-vascular disease, although it is admittedly uncommon, and that the disturbance can disappear when the drug is withheld.

Yours, etc.,

A. J. BARNETT,
F. O. SIMPSON.

Baker Medical Research Institute and
Alfred Hospital Clinical Research Institute,
Commercial Road,
Prahran, Victoria.
September 30, 1959.

[1] MED. J. AUST., 1959, 2: 46 (July 11).
[2] MED. J. AUST., 1959, 2: 299 (August 29).
[3] *J. Amer. med. Ass.*, 1956, 162: 868 (October 27).

CIGARETTE SMOKING AND LUNG CANCER.

SIR: Dr. Levene, in his letter of September 26, 1959, states that "early diagnosis of a possible bronchial carcinoma is sometimes neglected", and draws attention to two of his patients who were detected by mobile X-ray units. One patient was promptly referred to a thoracic unit and was placed on the waiting list for admission.

However, with regard to the other case, Dr. Levene has misrepresented the facts, in that within three weeks of this patient's having been found to have a possible neoplasm on mass radiography, a letter was sent to Dr. Levene stating that this suspicion was confirmed by a large X-ray. The letter also mentioned that, as the patient had suffered two coronary occlusions in the past six months and was still on anticoagulant therapy, he was not informed of the possibility of a new growth, as it was felt that his own doctor would be in a better position to break the news, if he thought fit. Furthermore, the patient was given his X-rays and told to report to his doctor in the near future, and an X-ray in three months' time was arranged, so that in the event of no action being taken, progress of the lesion could be followed.

Dr. Levene also failed to mention that the patient had been seen by an experienced chest physician on several occasions since 1952, who, on seeing the latest X-ray, agreed that the diagnosis of neoplasm was extremely likely, especially as a subsequent bronchogram showed lack of filling of the left upper lobe bronchus. At operation the patient had an advanced anaplastic carcinoma, removal of which was accomplished with considerable difficulty involving excision of the pericardium. Para-aortic glands were involved, and his prognosis was regarded as very poor.

In view of this, it seems inexplicable to me that Dr. Levene should claim credit for the diagnosis while at the same time accusing others of having failed to detect the condition or to inform him of its possibility.

The tragedy of carcinoma of the lung is that even when found on mass surveys, the most fruitful source of case-finding, the vast majority are beyond help, although any undiagnosed shadow in the lung should be, and is, referred for full investigation to exclude remediable conditions. The truth is that, as yet, we have no means of early detection of bronchogenic carcinoma, as once they are large enough to be seen on X-ray they are usually far advanced. Perhaps education of the public, and more emphasis on examination of sputum for malignant cells as suggested by Brock, might help reduce the tragic picture which prevails at the moment.

Yours, etc.,

ALLAN FRASER.

Anti-Tuberculosis Association of New South Wales,
Surry Hills, N.S.W.
October 7, 1959.

"Q" FEVER.

SIR: During the past year (July, 1958, to June, 1959) 410 cases of "Q" fever have been diagnosed in Queensland, and from a small number of sera submitted from New South Wales, 27 cases have been detected in that State. The cases from New South Wales have had a wide geographical distribution—e.g., Tenterfield area 17, Northern Rivers district 4, Broken Hill 5 and Newcastle 1. The disease is widely endemic in Queensland, and there is evidence that

it is also widespread in New South Wales and elsewhere in Australia.

As part of the routine serological investigation of pyrexias of unknown origin, routine complement-fixation tests with *Coxiella burneti* are included in the battery of tests performed on all sera submitted to the Laboratory of Microbiology and Pathology, Brisbane. Wherever possible, paired sera are tested, one collected as early as possible after the onset of the fever and one two weeks later. By this means it is possible to demonstrate a rise in titre of complement-fixing antibodies in recent infections.

At present "Q" fever appears to be associated with three main occupational groups, (*a*) meatworkers, (*b*) shearers and those associated with the sheep industry and (*c*) dairy farmers, in decreasing order of incidence. As might be expected, a marked preponderance of males are affected, in our present Queensland series there being 399 males and 11 females.

The firm diagnosis of "Q" fever is inevitably retrospective. It should, however, be considered in any patient with an appropriate occupation who presents with a febrile illness. It may masquerade clinically as infectious hepatitis, meningitis or encephalitis, and uncommonly, in this city, as a pneumonia. We have seen one case admitted as an acute abdomen and one as thrombocytopenia.

Of symptoms, the most consistent are headache and anorexia. Of signs, bradycardia is almost constant and splenomegaly occurs in over 50%. Atypical mononuclears are commonly found in the peripheral blood.

"Q" fever has long been regarded as an acute febrile illness in which complications are rare; but the illness is severe in a significant proportion, and the convalescence is occasionally prolonged for months. There is no doubt that some cases go on to a chronic form. There have been several reports of well-documented cases of endocarditis due to "Q" fever, and it would seem worthwhile to look for "Q" fever complement-fixing antibodies in the sera of cases of endocarditis producing a sterile blood culture. Liver involvement is common, and jaundice occurs in about 5%.

A plea is made for the consideration of "Q" fever in the differential diagnosis of many of the pyrexias of unknown origin occurring specially in those patients belonging to the specified occupational groups. It would seem worthwhile for the major routine diagnostic laboratories throughout Australia to use the complement-fixation test for *C. burneti* more frequently than has been done in the past. In those States where "Q" fever is not as yet notifiable, consideration might be given to this matter, in view of its obvious clinical, epidemiological and economic importance.

Yours, etc.

J. I. TONGE,
Laboratory of Microbiology and Pathology.
O. W. POWELL,
Medical Superintendent.
South Brisbane Hospital,
Brisbane.
October 6, 1959.

Post-Graduate Work.

THE MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

SUMMARY OF COURSES TO BE CONDUCTED IN MELBOURNE IN 1960.

THE following schedule has been drawn up as a guide for those who may be planning post-graduate study in Melbourne in 1960.

Courses for Higher Qualifications.

Part I.

Courses suitable for candidates for Part I of the M.D., M.S., M.G.O., D.O., D.L.O., D.P.M., D.D.R., D.T.R., D.A., Primary F.R.A.C.S., Primary F.F.A.R.A.C.S., and Part I of the Diplomas of the College of Radiologists:

Anatomy. The course commences on February 8 for D.P.M. and on February 15 for all other diplomas, and is conducted on Monday and Wednesday afternoons till August.

Physiology. The course commences on February 29, and is arranged similarly to that in anatomy.

Pathology. The course commences on March 7, and is conducted on Monday and Wednesday afternoons for four months. The course in pathology for F.R.A.C.S. and F.F.A.R.A.C.S. begins late in June and continues for six weeks.

Microbiology. The course commences on April 5 and is conducted on Tuesday afternoons for twenty or so weeks.

Physics. The course for radiodiagnosis commences on March 3 and is conducted on Thursday afternoons for eighteen weeks. The course for radiotherapy is conducted at times arranged when sufficient candidates present.

Psychology I. The course, conducted by the University of Melbourne, will commence in mid-March and continue, five hours per week, till late October.

Coaching Course in Anatomy, Physiology and Pathology for the Primary Fellowship. This course will be conducted from January 18, full-time for six weeks, for candidates who have already studied extensively, either by attendance at courses or privately. The 1960 class is already filled, but those interested in a similar course in 1961 should get in touch with the Post-Graduate Committee.

Note. Candidates are advised to undertake preliminary reading before commencing any part of the Part I courses. The Committee conducts all the foregoing courses except that in psychology.

Part II.

For senior medical qualifications such as M.D. or M.R.A.C.P., the honorary medical staff at the Royal Melbourne Hospital will conduct a course in medicine, probably commencing in June and continuing daily for six or eight weeks.

For senior surgical qualifications such as M.S. or F.R.A.C.S., the Royal Australasian College of Surgeons will conduct a course in surgery, full-time, from August 8 till October 14.

A basic course in microbiology, suitable for candidates for the M.S. and M.G.O. and the diplomas, will commence on April 5 and continue on Tuesday afternoons for about twenty weeks.

A course in basic pathology suitable for the above-mentioned candidates will commence on March 7, and continue on Monday and Wednesday afternoons for four months.

For candidates for the D.P.M., the Australasian Association of Psychiatrists and the Mental Hygiene Authority will conduct part-time courses in psychiatry and neuropathology, commencing in mid-March and continuing part-time for six months. The University of Melbourne will conduct a course in psychopathology part-time for eight months from March.

For candidates for the D.O., the Ophthalmological Society of Australia, B.M.A. (Victorian Division), will conduct 80 lectures in ophthalmology and special pathology, chiefly in the late afternoon, commencing on April 19.

For candidates for the D.A. and F.F.A.R.A.C.S., the Victorian Division of the Faculty of Anæsthetists, Royal Australasian College of Surgeons, will conduct training in the theory and practice of anæsthetics in a two weeks' intensive course commencing on July 4, and weekly evening tutorials in August and September.

The following courses will be held at times arranged when sufficient candidates present, and those interested should get in touch with the Post-Graduate Committee without delay: (i) a course in radiodiagnosis and special pathology, to be conducted by the College of Radiologists of Australasia; (ii) a course in radiotherapy and special pathology, to be conducted by the College of Radiologists of Australasia; (iii) a course in laryngology, otology and pathology, to be conducted by the Victorian Division of the Australian Otolaryngological Society; (iv) a course in gynæcology, obstetrics and special pathology, to be conducted by the Post-Graduate Committee, the Victorian Committee of the Royal College of Obstetrics and Gynæcology and the obstetrics department of the University of Melbourne.

Refresher Courses.

A refresher course in gynæcology and obstetrics for recent graduates will commence at the Royal Women's Hospital on January 25, and continue full-time for two weeks.

A refresher course in gynæcology and obstetrics for general practitioners will be conducted at the Royal Women's Hospital for two weeks, full-time, from September 12. Limited residence will be available.

Medical and surgical refresher courses for general practitioners will be conducted at two metropolitan hospitals

for two periods of one week each, commencing on dates to be announced in the autumn and spring.

The honorary medical staff of the Royal Children's Hospital will conduct a pædiatric post-graduate week from August 29.

ENROLMENT.

Commencement of courses depends on receipt of a satisfactory number of enrolments, the closing date in each case being two weeks before the date stated for commencement. Inquiries regarding all courses should be made through the conducting body, or may be addressed to the Melbourne Medical Post-Graduate Committee. The address of the Melbourne Medical Post-Graduate Committee is 394 Albert Street, East Melbourne, C.2. Telephone FB 2547.

Notes and News.

The Life Insurance Medical Research Fund of Australia and New Zealand.

The following grants for research into heart disease are announced by the Life Insurance Medical Research Fund of Australia and New Zealand. They will bring to a total of £220,000 the amount given by the Fund since its formation seven years ago.

Fellowships.

Dr. K. L. Cotton, of Sydney, has been granted an extension of his travelling fellowship, to enable him to carry out further research in the United States of America on blood flow through the valves of the heart.

Dr. F. O. Simpson, of Melbourne, has been granted a research fellowship, to carry out at the Baker Medical Research Institute, Melbourne, research on the structure of the heart muscle, and to investigate new drugs to combat high blood pressure.

Dr. G. D. Thorburn, of Sydney, has been granted a research fellowship, to carry out at the Hallstrom Institute of Cardiology, Royal Prince Alfred Hospital, and in the Department of Physiology, University of Sydney, further research on alterations in blood flow in valvular diseases of the heart.

Grants-in-Aid.

The following grants-in-aid have been awarded to institutions in New South Wales, Victoria and New Zealand:

Department of Physiology, University of Sydney (Associate Professor P. I. Korner): for further research into the regulation of the circulation of blood deficient in oxygen, and in certain valve defects of the heart.

Department of Pathology, University of Sydney (Professor F. R. Magarey): for continued research into the cause of degenerative disease of large arteries.

Unit of Clinical Investigation, Royal North Shore Hospital of Sydney (Dr. I. Monk): for investigation of new methods of surgical treatment for diseases affecting the valves of the heart.

Department of Pharmacology, University of Sydney (Dr. E. A. Johnson): for further research into the effect of drugs on the heart muscle in the treatment of heart failure.

Department of Surgery, University of Sydney (Professor John Loewenthal): for continued research into the treatment of diseases of the arteries affecting the blood supply to the limbs.

Fairfax Institute of Pathology, Royal Prince Alfred Hospital, Sydney (Dr. V. J. McGovern): for experimental research into the reaction of the inside lining of blood vessels, with particular reference to clotting of blood in blood vessels.

Baker Medical Research Institute, Alfred Hospital, Melbourne (Dr. T. E. Lowe): for continued research into the production of energy in the muscle of the heart.

University Department of Medicine, Royal Melbourne Hospital (Professor R. R. H. Lovell): for further investigation into the causes of high blood pressure.

Alfred Hospital, Melbourne (Dr. K. N. Morris): for research to assist further development of open heart surgery associated with the use of an artificial heart.

Department of Pathology, University of Melbourne (Professor E. S. J. King): for investigation into the cause of disease affecting the large arteries of the body.

Thoracic Surgery Department, Green Lane Hospital, Auckland (Dr. B. G. Barratt-Boyes): for further investigation of the effects of interrupting the circulation of blood to the lungs and of the cause of increased blood pressure in certain forms of congenital heart disease.

A Tribute to Sir Hugh Devine.

The August, 1959, issue of *The Australian and New Zealand Journal of Surgery* was produced as a compliment to the late Sir Hugh Devine and is subtitled the "Hugh Devine Number". Unfortunately, Sir Hugh died before its publication, although he had known about it and was looking forward to its appearance. It is certainly a handsome number and a fine tribute on the part of the Royal Australasian College of Surgeons to one of its most distinguished and devoted members. It contains a full-colour reproduction of the portrait of Sir Hugh Devine by W. D. McInnes, an appreciation of him by Douglas Miller, President of the College for 1959, and memoirs of him by Raymond Hennessy, as well as a reprint of a short article by Sir Hugh on surgical judgement. A series of contributed articles follow, overseas authors including Sir Gordon Gordon-Taylor, O. Theron Clagett (Mayo Clinic), Rodney Maingot, Denis Browne and Sir Gordon Bell. The College, the editor of the journal and the publishers are to be congratulated on the quality of this very fitting tribute.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

Quinquennial Election of Fellows.

AN election of ten Fellows by the graduates of the University of Sydney will be held on Thursday, November 12, 1959. The election will be conducted by ballot of the graduates voting personally or by voting papers transmitted through the post.

Personal votes will be taken at University Chambers, 167 Phillip Street, Sydney, and in the Greek Lecture Room at the University, on Thursday, November 12, 1959, between the hours of 10 a.m. and 5 p.m.

A duly qualified voter who desires to vote by post may, not later than the third day before the day of election, apply in writing for a voting paper to the Registrar. All voting papers transmitted by post and received at the University not later than 5 p.m. on the day of election shall be counted in the ballot.

Candidates.

Thirty-five candidates have been nominated to fill the 10 vacancies.

Ten candidates are members of the medical profession. They are as follows:

ANDERSON, DOUGLAS JOSEPH: M.D., Syd., (1940) (M.B., B.S. (Hons.), 1930), M.R.C.P., 1936, F.R.A.C.P., 1938; R.M.O. Sydney Hosp., 1930-1, Temp. Hon. Assist. Physn., 1939-46; R.M.O., Royal North Shore Hosp., Sydney, 1931-3; Hon. Assist. Physn., 1937-46 and 1947-57, Hon. Physn., 1957-; Tutor in Clin. Med., Univ. Syd., 1939-46 and 1948-57; Hon. Cons. Physn. (Tuberculosis), Randwick Auxiliary Hosp., Syd., since 1938; member B.M.A.; Pres., Sydney University Med. Society, 1932-33 (Vice-Pres., 1930-1, 1933-4, 1937-46, 1947-); Pres., Old Sydney Hospitallers' Club, 1947-8; Pres., Sydney University Union, 1946-7; Editor, Sydney University Med. J., 1928-30.

BLACKBURN, SIR CHARLES BICKERTON, Kt. Bach., O.B.E.: B.A., Adel., 1893, M.D., Syd., 1903 (M.B., Ch.M., 1899), F.R.A.C.P., 1938, F.R.C.P., 1939, F.R.S.M., Lond., D.Sc. (Hon.), N.S.W. Univ. Tech.; Hon. D. Litt., Univ. New England; Hon. LL.D., Melb.; Hon. D.Sc. (Tas.); R.M.O., Royal Prince Alfred Hosp., Syd., 1899-1900, Med. Supt., 1901-4, Hon. Assist. Physn., 1904-11, Hon. Physn., 1911-34, Hon. Cons. Physn. since 1934; Hon. Physn., The Prince Henry Hosp., Syd., since 1934; Lecturer in Clin. Medicine, Univ. Syd., 1912-34, Dean of Faculty of Medicine, 1932-5; Fellow of Senate, Univ. Syd., since 1919; Chancellor, Univ. Syd., since 1941; First World War, Lt.-Col., A.A.M.C., active service, despatches twice, O.B.E.; Second World War, Lt.-Col., home service, 113 A.G.H.; member B.M.A., Pres., N.S.W. Branch, 1920-1; Pres., Royal A/asian Coll. Physns., 1938; former Bancroft Orator; Hon. member Assocn. Physns. Gt. Brit. and Irel.

BUCKINGHAM, REGINALD ERIC, M.C.: H.D.A., 1913, M.B., Ch.M., Syd., 1926, D.L.O., Lond., 1928, F.R.C.S., Edin., 1929, F.R.A.C.S., 1932, formerly Hon. Eye, E.N. & T. Surg., Dubbo Base Hosp., N.S.W.; First World War, combatant (Capt.) in R.F.C., 1916-9, Croix de Guerre, M.C.; Second World War, Part-time M.O., R.A.A.F.; member B.M.A.

HOWE, GEOFFREY LANGFORD: M.B., Ch.M., Syd., 1926; Hon. Visiting M.O., Ryde Dist. Soldiers' Memorial Hosp., Royal Ryde Homes, and Lottie Stewart Hospital, Dundas, N.S.W.; Second World War, Capt., A.A.M.C. Reserve, 1940; R.M.O., 3 A.O.V.P., North Ryde, 1942-6 (part-time); member B.M.A., Pres. N.S.W. Branch, 1957-8; Dist. Governor, 275th Rotary Dist., 1957-8; member of Council, Med. Benefits Fund of N.S.W. Ltd., Vice-Pres. Med. Benefits Fund of Aust. Ltd.; Member of Council and Board of Censors, Coll. Gen. Practnrs., N.S.W. Faculty; Chairman of Directors, British Medical Insurance Co. of N.S.W. Ltd.

HUNTER, JOHN GEORGE, C.M.G.: B.Sc., 1909, M.B., 1915, Ch.M., 1919, Syd.; Hon. Assist. Physn., Sydney Hosp., 1923-9; Hon. Physn., Royal South Sydney Hosp., 1927-9; Lecturer in Medical Ethics, Univ. Syd.; First World War, Capt., A.A.M.C., C.M.F.; member B.M.A., Medical Secty., N.S.W. Branch, since 1929, Gen. Secty., Federal Council, since 1934; awarded Gold Medal of the B.M.A. in Australia, 1956; Secty. for Australasia, World Medical Assoc.; Member, Board of Directors, British Medical Insurance Co. of New South Wales Ltd.; member A/asian Antarctic Expedition, 1911-4; C.M.G., 1957; Justice of the Peace.

MACCALLUM, WALTER PATON, C.B.E., D.S.O., M.C., E.D.: M.B., Ch.M., Syd., 1924, F.R.A.C.P., 1946 (M.R.A.C.P., 1939); R.M.O., Royal Prince Alfred Hosp., Syd., 1924, Coast Hosp., Syd., 1925, Royal Alexandra Hosp. for Children, Syd., 1925-6; Hon. Relieving Assist. Physn., 1926-36, Hon. Assist. Physn., 1936-46, Hon. Physn., Royal Alexandra Hosp. for Children, Syd., 1946-55, Hon. Cons. Physn. since 1955; Hon. Assist. Physn., Royal Prince Alfred Hosp., Syd., 1934-55, Hon. Cons. Physn., since 1955; Visiting Physn., Prince of Wales Hosp., Syd., 1946-9; Visiting Specialist Physn., 113 (Concord) A.G.H., 1946-7; Visiting Specialist Physn., Out-Patient Clinic and Repatriation Gen. Hosp., Sydney, 1947-; Hon. Physn. to Gov.-Gen., 1946-50; Hon. Cons. Physn., Ryde Dist. Soldiers' Memorial Hosp., Syd., since 1948; Hon. Cons. Physn., Prince Henry Hosp., Syd., since 1955; First World War, Inf. and Staff, A.I.F., 1915-9 (Gallipoli, Egypt, France, Belgium), Major; despatches thrice, M.C., D.S.O., 1919; Second World War, A.A.M.C., 1940-7 (Palestine, Western Desert, Greece, Crete, N.E.I., S.W.P.A.); Registrar, 2/5 A.G.H.; D.A.D.M.S., H.Q., 1 Aus. Corps; C.O., A.A.M.C. Trg. Wing in M.E.; A.D.M.S., H.Q., A.I.F. in M.E.; D.D.G.M.S., L.H.Q.; D.D.G.M.S., Adv. L.H.Q.; D.D.G.M.S., H.Q., A.M.F.; despatches, C.B.E., E.D.; Brigadier, A.A.M.C. Reserve; Hon. Col., R.A.A.M.C., since 1957; member B.M.A.; Hon. Secty., Royal A/asian Coll. Physns., 1948-50, Hon. Treas. 1950-8.

McDONALD, CHARLES GEORGE, C.B.E.: M.B., 1916, Ch.M., 1928, Syd., F.R.C.P., Lond., 1956, F.R.A.C.P., 1938; Hon. Cons. Physn., Royal Prince Alfred Hosp., Syd.; Hon. Cons. Physn., Royal North Shore Hosp., Syd.; Hon. Cons. Physn., Lewisham Hosp., Syd.; Assoc. Hon. Physn., Prince Henry Hosp., Syd.; Hon. Examining Physn., Queen Victoria Homes, formerly Lecturer in Clinical Medicine, Univ. Syd.; Lecturer in Post-Graduate Medicine, Univ. Syd.; member of Faculty of Medicine, Univ. Syd.; Fellow of Sydney University Senate since 1942, member of Finance C'tee since 1943; Deputy Chancellor, Univ. Syd., 1953-4; Chief M.O. and Dir., Mutual Life & Citizens' Assurance Co. Ltd.; member of N.S.W. Medical Board (nominated by Sydney University); Chairman, Australian Rheumatism Council, 1959; First World War, Capt., A.A.M.C., A.I.F.; Second World War, Lt.-Col., A.A.M.C., A.I.F., Middle East, despatches; member B.M.A.; formerly Hon. Sec., Vice-Pres., and Censor-in-Chief, Royal A/asian Coll. Physns., President, 1954-6; late member Exec. C'tee, Royal A/asian Coll. Physns.

MORROW, SIR WILLIAM, D.S.O., E.D.: M.B., B.S., Syd., 1927, F.R.C.P., Lond., F.R.A.C.P.; R.M.O., Royal Prince Alfred Hosp., Syd., 1927, Deputy Supt., 1932, Hon. Assist. Physn., 1934, Hon. Physn., 1951; Hon. Cons. Physn., Canterbury Dist. Memorial Hosp., Syd., Marrickville Dist. Hosp., Syd., and Western Suburbs Hosp., Syd.; Lecturer in Therapeutics, Univ. Sydney; Second World War, A.A.M.C., despatches, D.S.O.; Col., R.A.A.M.C. Reserve; member B.M.A., member N.S.W. Branch Council, Pres. N.S.W. Branch, 1958; member Council Royal A/asian Coll. Physns.

MURRAY, ANGUS JOHNSTON, O.B.E.: M.B., Ch.M., Syd., 1923, F.R.C.S., Edin., 1927, F.R.C.O.G.; R.M.O., Royal Prince Alfred Hosp., Syd., 1923-4, and Coast Hosp., 1924-6; Hon. Obstetrician and Gynæcologist, Royal North Shore Hosp., Syd.; Hon. Cons. Gynæcologist, Prince Henry Hosp., Syd.; First World War, 18 Bty., 6 Army Fld. Arty. Bde.; Second World War, A.A.M.C., 1940-5, O.C. Surgical Division, 2/5 A.G.H., 1942-3, C.O., 2/5 A.G.H., 1944-45; Col., A.A.M.C., retired list; member B.M.A., member Council, N.S.W.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED SEPTEMBER 26, 1959.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	1	2	2	..	..	..	..	..	5
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	1	..	..	..	3	..	4
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	1(1)	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	6(2)	15(12)	1	..	..	..	..	1	23
Diphtheria	..	..	..	..	2(2)	..	..	..	2
Dysentery (Bacillary)	..	2(1)	1	1(1)	1	..	1	..	6
Encephalitis	..	2(2)	..	1(1)	..	..	..	..	3
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	90(49)	26(17)	15(3)	10(6)	5(1)	..	..	..	146
Lead Poisoning	..	..	..	..	1(1)	..	..	..	1
Leprosy	..	..	..	..	1	..	1	..	2
Leptospirosis	..	..	4	..	..	..	..	..	4
Malaria	..	..	4(4)	..	..	..	..	..	4
Meningococcal Infection	3(1)	3(3)	1(1)	..	..	..	..	..	7
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	5(4)	..	1	..	..	..	..	..	6
Puerperal Fever	1	..	..	..	..	..	..	..	1
Rubella	..	13(10)	1(1)	1(1)	..	..	3	..	18
Salmonella Infection	..	..	..	..	..	..	..	1	1
Scarlet Fever	11(9)	9(5)	8(5)	15(6)	..	..	..	..	43
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	1	..	..	..	..	..	1
Trachoma	..	..	..	..	110	..	69	..	179
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	29(16)	20(10)	7(2)	2(1)	3(2)	1(1)	..	..	62
Typhoid Fever	..	..	..	..	1(1)	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	1	..	..	..	1
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

Branch, Pres., 1953, member Fed. Council, 1947, Vice-Pres., 1955-.

SELLE, HAL: M.B., B.S., Syd., 1938, F.H.A.; R.M.O., Royal Prince Alfred Hosp., Syd., 1939, Gen. Supt., 1944-58; Chairman, Hospitals Commission of N.S.W.; Second World War, A.I.F., 1939-44; Col., R.A.A.M.C.; member B.M.A.

Medical Research Fellowships.

Applications are invited for the following medical research fellowships of the University of Sydney for the year 1960: Reginald Maney Lake Scholarship and Amy Laura Bonamy Scholarship for pathological research; Anderson Stuart Memorial Research Fellowship, Marion Clare Reddall Scholarship and Joseph Goodburn-Smith Scholarship for research in any branch of medical science; Liston Wilson Fellowship for research in spastic paralysis or some closely allied subject; Norman Haire Fellowship for research in sexology, continuing and expanding work already being done in the Faculty of Medicine; Sister Sanders Scholarship for part-time research work into some aspect of the diseases of children, with particular reference to the preventive aspect.

Fellowships are renewable for a second and, in certain circumstances, a third year. All fall due on January 1, 1960. All are to the value of £1575 or £1908 *per annum* according to qualifications and experience except the Sister Sanders Scholarship, which is to the value of £540 *per annum*.

Applications for fellowships for 1960 should be made to the Registrar, and will close on November 27, 1959. The fellowships for 1960 will be awarded in December, 1959. Application forms may be obtained from the Registrar's office. Details of these fellowships are given in the "Calendar of the University of Sydney" for 1959, at pages 502 to 506.

The World Medical Association.

THIRTEENTH GENERAL ASSEMBLY.

Election of Officers.

AT its thirteenth General Assembly, held at Montreal, Canada, on September 6 to 12, 1959, the World Medical Association elected the following officers: *President*, 1959-1960: Dr. Renaud Lemieux (Canada). *President-Elect*, 1959-1960: Dr. Paul Eckel (Germany). *Members of Council*, 1959-1962: Dr. Romeo Y. Atienza (Philippines), Dr. Gunnar Gundersen (U.S.A.), Dr. A. P. Mittra (India), Dr. M. Poumailloux (France).

The Council of the World Medical Association elected the following officers for the coming year: *Chairman of Council*: Dr. L. R. Mallen (Australia). *Vice-Chairman of Council*: Dr. Gunnar Gundersen (U.S.A.). *Executive Editor, World Medical Journal*: Dr. Stanley S. B. Gilder (Canada).

The officers of committees for 1959-1960 include: *International Liaison*: Dr. Jean Maystre (Switzerland), Chairman. *Medical Education*: Dr. L. A. Hulst (Netherlands), Chairman. *Medical Ethics*: Dr. Hugh Clegg (U.K.), Chairman. *Planning and Finance*: Dr. T. C. Routley (Canada), Chairman, Dr. E. S. Hamilton (U.S.A.), Vice-Chairman. *Socio-Medical Affairs*: Dr. Félix Worré (Luxembourg), Chairman, Dr. Rolf Schlögell (Germany), Secretary. *Liaison Officers*: Dr. Jean Maystre (Switzerland), Dr. V. A. Fenger (Denmark).

Nominations and Elections.

THE following have applied for election as members of the New South Wales Branch of the British Medical Association:

Brash, David, M.B., Ch.B., 1942 (Univ. Glasgow), D.M.R., London, 1945. Cnr. Bent Street and Waldron Road, Chester Hill.

Hamilton, Robert Ian Charles, M.B., B.S., 1958 (Univ. Sydney), 32 Crabbes Avenue, Willoughby.

Hazler, Charles, M.D., 1931 (Univ. Budapest) (registered under Section 17 (2B) of the *Medical Practitioners Act*, 1938-1958), Public Health Department, Rabaul, Territory of Papua and New Guinea.

Singer, Henrik, M.D., 1921 (Univ. Budapest) (registered under Section 17 (2A) of the *Medical Practitioners Act*, 1938-1958), 15 Grosvenor Street, Bondi Junction.

Diary for the Month.

OCTOBER 31.—New South Wales Branch, B.M.A.: Branch Meeting.
NOVEMBER 3.—New South Wales Branch, B.M.A.: Organization and Science Committee.
NOVEMBER 4.—Western Australian Branch, B.M.A.: Branch Council.
NOVEMBER 5.—South Australian Branch, B.M.A.: Council Meeting.
NOVEMBER 6.—Queensland Branch, B.M.A.: Clinical Meeting in conjunction with Mater Misericordiæ Hospital Clinical Society.
NOVEMBER 10.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
NOVEMBER 11.—Victorian Branch, B.M.A.: Branch Meeting.
NOVEMBER 12.—New South Wales Branch, B.M.A.: Public Relations Committee.
NOVEMBER 13.—Queensland Branch, B.M.A.: Council Meeting.
NOVEMBER 13.—Tasmanian Branch, B.M.A.: Branch Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations, other than those normally used by the Journal, and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference to an article in a journal the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of article. In a reference to a book the following information should be given: surname of author, initials of author, year of publication, full title of book, publisher, place of publication, page number (where relevant). The abbreviations used for the titles of journals are those of the list known as "World Medical Periodicals" (published by the World Medical Association). If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the EDITOR.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this Journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in Australia can become subscribers to the Journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £6 *per annum* within Australia and the British Commonwealth of Nations, and £7 10s. *per annum* within America and foreign countries, payable in advance.